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AMERICAN ANTIQUITY

VOL. VII OCTOBER, 1941 No. 2, Part 1

EDITORIAL

MUMBO JUMBO has always been a means by which the priests of secret cults have sought to mystify and impress their followers. If the intiates can build up a language of secret words of which only they know the meaning, then they are bound together and at once set apart from lesser men by their secret mysteries.

One can hardly blame the casual reader in search of information if he seems to feel that archaeologists are forming a secret society, with a special jargon known only to its initiates. There's no particular sense in listing some of the words that sail before our eyes; their authors are still probably proud enough of their inventions to remember them and to realize that others are still wondering just what particular shade of meaning, unknown to ordinary English, was intended by some of these hybrids.

But consider the large number of people who are earnestly interested in the study of archaeology and on whom even the most sheltered of workers in endowed institutions must ultimately depend. How do they enter into this colossal game of Guess-what-I-mean?

One member, and he speaks for many of his fellows, professional and non-professional, writes as follows:

"... If I were to receive only one of the publications I think I would prefer the Notebook to AMERICAN ANTIQUITY. ... Some articles in AMERICAN ANTIQUITY are written in plain everyday layman's language whereas other articles are written in a very technical 'archaeological language.' In some cases, one might almost think that the object of this latter 'language' is to confuse the reader. Now it may be that these very competent authors do not wish to write for the layman, but surely the majority of the membership is composed of amateurs and not professionals. The technical wording used in some articles is as abstruse and confusing as that of a lawyer trying to conceal facts."

Perhaps it is not too much to ask ourselves whether what we have written could not have been said more simply? Or shall we follow the lead of one of our scintillating contemporaries and start a WADDAYAMEAN DEPARTMENT?

THE DIRECT-HISTORICAL APPROACH IN CALIFORNIA ARCHAEOLOGY

ROBERT F. HEIZER

THE ARCHAEOLOGICAL BACKGROUND

THE field of California archaeology has long been considered an example of unproductive and timeless culture. This judgment has hardly been a fair one, yet the fault lay not with the anthropological public but rather with the local archaeologists, since field work was rare, intermittent, and unplanned. No scientific institution has ever found it possible or deemed it advisable to institute a long-term archaeological survey of the area. However, the past ten years have seen the recording of sufficient data to demand a retraction of the older viewpoint which offered little promise in future work. In 1929, David Banks Rogers published his volume on the archaeology of the Santa Barbara region;[1] Olson's preliminary report followed a year later.[2] Both treatises are in essential agreement as to the type and succession of prehistoric cultures on the Santa Barbara coast.[3] In 1929, Schenck and Dawson produced their report on the archaeology of the northern San Joaquin Valley which rather hesitantly advanced their view that there had been certain cultural change in the Stockton-Lodi area.[4] In the area immediately to the north (the Cosumnes Valley) the Sacramento Junior College began, in 1933, a long-range program with the aim of defining the archaeological configuration in the lower Sacramento Valley. Their careful work is still in progress and, as time has progressed, this institution under the direction of President J. B. Lillard has accumulated a great mass of data and collections upon which only preliminary reports have appeared.[5] Complete and full recording of single site excavations are in part completed, but it is difficult to find publication outlet. The broad archaeological outlines are emerging; when these have been further tested and their horizontal, i.e. distributional, extensions can be estimated, there may be more demand for complete site-by-site archaeological reports.

Beginning with W. R. Wedel's work on the San Francisco Bay shell mounds in 1935, the University of California at Berkeley has been continuously active. Its interests have coincided with those of the Sacra-

---

[1] Rogers, D. B., 1929, Heizer, 1941*b*. Bibliography, see pp. 141–146 of this issue.

[2] Olson, 1930.

[3] Olson, 1934; Heizer, 1939. For the region immediately to the east see Wedel, 1941.

[4] Schenck and Dawson, 1929, pp. 402–403.

[5] Lillard and Purves, 1936; Lillard, Heizer and Fenenga, 1939; Heizer and Fenenga, 1939.

mento Junior College with whom close collaboration has, since the beginning, led to a joint attack on the archaeological problems.[6]

In the 1939 papers an attempt was made to summarize field data from a selected series of fifteen sites. Both stratified and pure culture sites were considered; they were chosen to illustrate the range of known archaeological situations existing in the area. Three cultural horizons, Early, Transitional, and Late, were demonstrated. Within these three distinctive complexes there are phases, reflecting earlier or later stages of development. The reader is referred to the reports for fuller information on these three cultures. Sufficient for present purposes is the statement that the Early culture has an apparently respectable antiquity[7] and is thus far the oldest horizon discovered. The Transitional culture follows and is, in part, an outgrowth of the Early complex, but contains numerous characteristic elements which appear for the first time in this period. Following the Transitional period in time comes the Late culture. So striking is the break in the cultural and physical type[8] that we are led to conclude that an influx of new people with their culture was registered in the area. During Transitional times this process was taking place slowly, as judged from the progressive alteration of the physical type and introduction of new cultural elements; it is not until Late culture times that the new physical type and culture become dominant.

THE PROBLEM AND APPROACH

We have divided the Late culture into three phases:[9] Phase 1 (prehistoric), Phase 2 (protohistoric),[10] and Phase 3 (historic or post-contact). It is the aim of this paper to examine more in detail the validity of this classification of Late culture, and to define more strictly what we believe to have been the processual factors involved in the transition of native central Californian cultures from the prehistoric to the full historic period.

---

[6] Reports of the University's field work have been presented, in summary, in Lillard, Heizer and Fenenga, 1939; Heizer and Fenenga, 1939.

[7] The problem of dating the Early culture is being attacked by physiographers, and soil chemists working with the archaeologists. The indications of definitive results are promising. See Krieger, 1940.

[8] See Heizer and Fenenga, 1939, p. 394; Lillard, Heizer and Fenenga, 1939, p. 73; Stewart, 1940, p. 41; Kroeber, 1938.

[9] Lillard, Heizer and Fenenga, 1939, pp. 79–82.

[10] Protohistoric as defined and used here signifies sites or cultural remains which are post-European in time, i.e. in the larger California area, but not necessarily in *evidence*, i.e. metal objects or glass beads. This point will be more clearly brought out in the discussion. Wedel's definition of protohistoric (1936, p. 24; 1940, p. 297) is somewhat different. Cf. our definition to Wedel, 1940, p. 317.

The central aim of archaeology is to give as full a picture as possiblg of cultural antiquity. How completely such history may be recoveree from ancient remains depends upon many factors, and important amond these is the approach to the problem. Without tree ring dating, and dealing with non-pottery making cultures,[11] the California area is less favored than e.g. the Southwest, where sites can be exactly dated, or other areas where minutiae of time differentiation can be demonstrated by fluctuations in pottery techniques. For broad time distinctions, we are fortunate in having a large number of stratified sites. Stratification, so common in our valley area, has done yeoman's service, but cannot be an end in itself. Certain environmental factors (rivers, overflow basins, dependence on fishing, valley-floor hunting, oak groves, etc.), which have apparently remained fairly constant for a very long time, have led to successive occupation of certain favorable locations—hence abundant stratification.[12]

The Late culture, with its three distinguishable phases, terminates in the historic period. Thus, it presumably represents the archaeological manifestations of the Indian tribes which inhabited the area in historic times. This presumption, together with a very long period of historical contact without Caucasian occupation or settlement, and an abundant, though areally spotty, ethnographic record, has indicated the possibility of effecting a correlation of these three primary sources of information—historical, archaeological and ethnographical. This is the problem the present paper makes an attempt to treat.

Intensive reading in the historical records, unpublished for the greatest part and in manuscript form in the Bancroft Library Collections, and ethnographic accounts for the area where archaeological investigations had been concentrated, made it apparent to me that: (1) the ethnographic record was highly imperfect; (2) the historical documents might help to fill some of these lacunae; (3) the geographic location of certain native groups was a matter of relatively recent standing; and (4) a widespread cultural alteration had ensued in the valley following the establishment of the Spanish missions on the coast. This cultural development, dating, we believe, from the latter part of the eighteenth century (circa 1780) until the middle of the nineteenth century (varying between 1830 to 1850, depending upon the locality) is not apparent from the ethnographic records (gathered after 1900), nor alone from the early historical accounts. Both of these documentary types support and furnish the lead for interpretation of the then-contemporary ar-

[11] There is some crude pottery in southern California outside our area. See Gayton, 1929; Rogers, M., 1936; Heizer, 1937.

[12] For the various types of stratification, see Heizer and Fenenga, 1939, p. 380.

chaeological situation. Indeed, it was not until certain unusual interpretations, previously unsuspected, obtruded themselves to explain the archaeology that we first got hints as to the extent of cultural readjustment in pre-ethnographic times.

The story of a protohistoric, pre-ethnographic culture change attributable to white contact and set into motion by white intervention is not a new story. In the Plains area such a process has been broadly outlined by such enlightened archaeologists as Strong, Wedel, and Hill.[13] Here the introduction of the horse, its immediate acceptance and applicability to the grass-covered Plains and buffalo hunting, led to abandonment of agriculture and sedentary villages and the adoption of a nomadic, hunting existence. The acquisition of the horse, lending hitherto undreamed-of mobility to the Indians, and ever increasing white pressure from the east, led to tremendous readjustments of habitat and cultural contact.[14] Here also, then, occurred far reaching cultural changes as a result of Caucasian influences, direct or indirect. So much change took place prior to the period of white settlement, and was so directly native in evidence and effect, that it remained for long unsuspected. Plains archaeology gave the first indications of historic changes, and with this lead the historical documents became extremely important, the final result being a new interpretation of the ethnographic situation which seemed relatively "timeless."

THE HISTORICAL BACKGROUND

Let us now turn to the examination of the central California situation. Rather than giving the entire picture and presenting the raw field data, I have considered it advisable to treat this in outline, since it is the correlated historical-ethnographical-archaeological approach that seems to be of wider, more general, interest.

The historical record begins, in upper California, with the date 1542 which marks the visit of Cabrillo to the Chumash of the Santa Barbara Channel region. In 1579, Sir Francis Drake landed on the coast north of San Francisco Bay; an account of the Indians is handed down in Fletcher's journal of the famous voyage. In 1602, Vizcaino coasted California, leaving an account of the Indians he saw. Finally in 1769, the first land expedition came up the coast of California, the accompanying priests picking out likely locations for mission establishments. Hispanic colonization was closely associated with conversion. Wherever the

[13] Full documentation is impossible here. See Strong, 1930; 1935, pp. 55–68; Wedel, 1935, 1936, 1940; Kroeber, 1939, pp. 76–88.

[14] This process, little known and less advertised, also occurred in the South American Chaco. See, e.g., Kersten, 1904; Bazan, 1931; Dobrizhoffer, 1822.

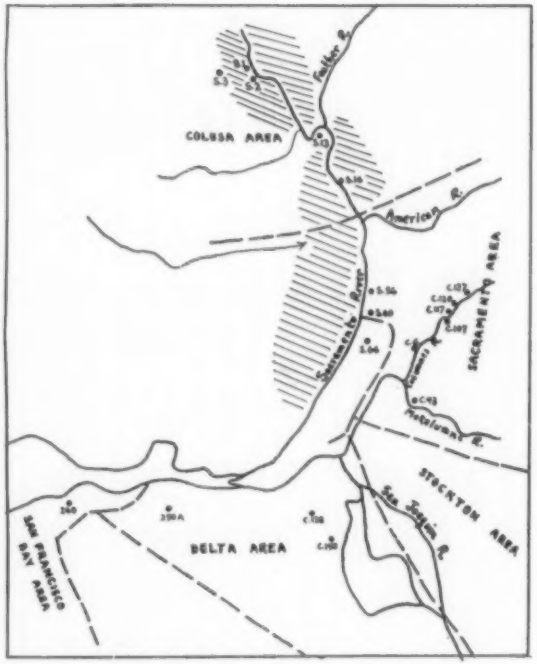

FIG. 9

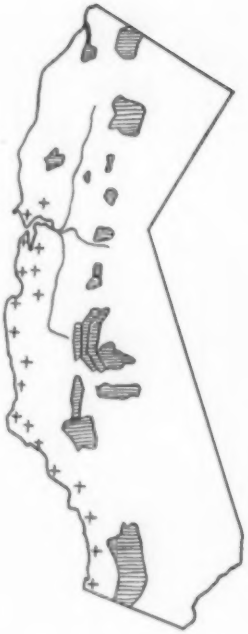

FIG. 10

FIG. 9.—The lower Sacramento Valley showing archaeological sub-areas and site locations. Hatched areas are uninhabitable, swampy, overflow regions.

FIG. 10.—Mission sites (+), and proposed reservation areas (=) set aside for California Indians 1851–1852, showing general areas of native population in this period; see Kroeber, 1939, p. 154 for aboriginal and post-white population intensities.

banners of Spain waved, there was also planted the cross of Christ. Concentrated native populations along the coast led to the establishment of a chain of coast missions beginning in 1769 (Mission San Diego) and culminating in 1823 with the founding of Sonoma Mission north of San Francisco Bay (Fig. 10). The missionary's harvest was rich; in 1806 there were nineteen missions with a total resident Indian population in excess of 18,000. Finally, the local native populations were exhausted and converts were gathered from farther and farther inland. Missionization was not always completely successful, and runaway neophytes were the cause of continual trouble to the missionaries. Such runaways returned to their interior homes, mingled with their unconverted brethren, and were often successful in organizing native expeditions against the mission or pueblo establishments for the purpose of stealing horses. An almost invariable rule at most missions was that no runaway Christian Indian should succeed in escaping without pursuit by soldiers. To have allowed them to go unmolested or unnoticed would have created a dangerous precedent.[15] The cruel actions of the soldiers were necessary, and it is stated that the unconverted natives often refused their baptized fellows admittance to their old homes due to fear of Spanish retaliation.[16] Their main business being the pursuit of runaways,[17] a great number of military expeditions for the purpose of punishing gentiles who harbored runaways, for retrieving stolen property (mainly horses) and recovery of deserters, were made into the Central Valley from the coastal mission establishments. Bancroft[18] has mentioned most of these; Schenck[19] inspected these accounts in view of defining the ethnic situation of the interior valley in pre-ethnographic times. There has been no complete summary of the early historical ethnic situation in the Central Valley, and when such a study is some day done, it should take into consideration the fact that this was a period of flux, a time of cultural and habitat readjustment, as demonstrated by archaeology.

As early as 1800, plans were advanced for the formation of an inland chain of missions whose aim would be to gather, there in the populous Central Valley, the rich harvest of souls. By 1815, such proposals became more insistent, the reasons advanced being that the coastal tribes had all been converted, and that subjection of the interior natives was

overflow regions.

Fig. 10.—Mission sites (+), and proposed reservation areas (=) set aside for California Indians 1851–1852, showing general areas of native population in this period; see Kroeber, 1939, p. 154 for aboriginal and post-white population intensities.

[15] A gentile (unbaptized pagan) could come and go at will, but a neophyte (baptized Indian) was the property of the church. See Englehardt, 1912, II, pp. 263–64; von Kotzebue, 1814, III, p. 45.

[16] Beechey, 1836, p. 421; Fremont, 1887, p. 360.

[17] See also Bancroft, 1884, I, pp. 584–85, who indicates pursuit of deserters was not practiced in all missions.

[18] Bancroft, 1884, I; 1886, II. See also Chapman, 1930, Chap. 32; Papen, N. D.

[19] Schenck, 1926; Gifford and Schenck, 1926, pp. 20–28.

imperative because constant forays against the coastal missions were threatening their existence. I cannot refrain from quoting Fr. Payeras' report on the missions, 1817–1818.[20]

> In all the coast there is hardly to be found a gentile except among those who come down from the great valley of the Tulares[21] or descend from the mountains that lie between the valley and the coast . . . .
>
> The Propagation of the Faith among the gentiles being the high aim of the missionary, and this work having ceased by reason of completion on the coast range of missions, all missionaries long for it. In various missions baptizing natives northeast of them, in the land called the Tulares, has been tried, but always with a bad result, and especially so in the missions of the North, because the Tulareños are fickle to the limit—today here and tomorrow gone—not on foot, for they move only on horseback. So it is that with such guests no live stock is safe in all the Valley of the North; and the worst of it is that after traveling with horses on the run through all the valley of the Tulare and the mountains that surround it, they finally kill and eat the animals. The Government has not been negligent in pursuing them, but has made little progress, since immense lakes completely surrounded by green tules give them shelter, food, and secure hiding place.
>
> If these ideas are not approved (i.e. of building an inland chain of missions and presidios) and if there be not made some adequate provision for correcting and holding within bounds the runaway Christians before they become incorporated with the immense gentile population of said Tulares, there will arise a situation threatening the existence of the Province, and transforming into a new Apacheria a country which until recently has been the center of tranquility.

In the southern San Joaquin Valley the Spanish (Capt. Fages) had entered by 1773, and Garces in 1776 found there a Spaniard deserter who already had started a half-breed family.[22] The southern valley people seem to have gotten horses by 1800. They learned to ride and eat horses at the missions which they deserted and taught their unconverted brethren in the non-Christian interior who, it appears, took readily to an equivorous diet.[23] Horses were being stolen from Mission San Jose by at least 1783 and taken into the San Joaquin Valley.

After the missions were established at San Francisco (1776) and

---

[20] Beattie, 1928, pp. 248, 249. This paper gives some very important information on the subject of inland natives and their pressure on the coastal establishments. See also Gudde, 1936, pp. 28–29; Englehardt, 1913, III, pp. 33–34.

[21] These would be Southern Yokuts from the upper San Joaquin Valley. See Mason, 1912, p. 115.

[22] Gifford and Schenck, 1926, pp. 20–28; Bolton, 1931*a*, pp. 217–218; Gayton, 1936; Bancroft, 1886, II; Bolton, 1931*b*, pp. 388–394. Walker's valuable preliminary report on the Elk Hills site yields a maximum historic dating of 1780 on the basis of Caucasian-made objects (Walker, 1935). See also Wedel, 1941, pp. 151–153.

[23] Bancroft, 1886, II, pp. 335, fn. 30 translating from Payeras' account of 1819 says that "The best horses are being stolen; that in the Tulares all ride, even the women; and that regular fairs for the sale of horses are held there." See also Beattie, 1928, pp. 343–344; Torchiana, 1933, p. 270.

San Jose (1797) in the north, the same type of situation developed as on the southern coast and in the southern interior. The local Indian groups were soon converted and it was necessary to draw neophytes from more and more distant groups. On the Canizares map of the San Francisco Bay area (1776)[24] there are shown Indian villages on the Bay and in the Carquinez Straits area. These are lacking on later maps. Expeditions after deserting neophytes became necessary before 1800, and it is stated repeatedly that the natives were always situated in the most inaccessible locations possible. Indeed, the Delta area with its network of streams and tule swamps, and in aboriginal times half-covered with overflow water, was an ideal retreat area where mounted Spanish horsemen would find it difficult to penetrate.[25] Duhaut-Cilly[26] (1827) said: "To avoid danger of incursions often unjustly made to their settlements, they usually select for sites for their villages, solid pieces of ground surrounded by marshes which the Spanish call *Tulares*, from the great quantity of reeds growing there. Thither the Californian riders cannot come with their horses." Gradually the villages withdrew farther and farther from the reach of the Spanish expeditionary forces. As Schenck, after Bancroft, points out, an expedition of 1819 recovered forty-nine horses from the Moquelumne Indians,[27] and in 1820 another expedition took seventy horses from the Cosumnes.[28] Bancroft[29] mentions an expedition by Fages in 1783 against the gentiles of the San Jose region who had stolen horses. In 1788, it was necessary to punish the Indians again for the theft of horses. After about 1840 the white pressure grew stronger, settlements were begun, and the Indians either adopted the protection of American settlers (e.g. John Marsh, Captain Sutter, etc.) and began to relinquish native ways, or they retreated still further from direct contacts with the encroaching whites. A study of the accounts dating from 1835 to 1850 points a continual retraction of native groups northward up the valley. When the U. S. Exploring Expedition under Wilkes navigated the Sacramento River, through what is now Yolo and Colusa counties in 1841, they found the natives, River Patwin, very little influenced by white culture. This part of the valley was to all intents and purposes still native. After the gold rush of 1848 the country filled rapidly with farmers and miners. The natives, unprotected and

[24] Watson, 1934. Font in 1776 (Bolton, 1931*b*, Chaps. 15–16) saw and described many Indians in the Straits.

[25] Font's vivid account of the difficulties of Delta travel (Bolton, 1931*b*, pp. 396, 406–409), for the Tulare region, see Gayton, 1936. [26] Duhaut-Cilly, 1929, p. 313.

[27] Schenck, 1926, p. 140; Bancroft, 1886, II, p. 335.

[28] Schenck, 1926, p. 142. Site C.6, a large protohistoric center, is in Cosumne territory. [29] 1884, I, pp. 479–480.

powerless, were nearly exterminated, indeed, actually were in some sections.

I have traced in broad outline the general historic picture in the Central Valley. To present the factual data would require a book; at least one other would be needed to contain the interpretation with a list of the sources. I shall attempt next to present the general outlines of the three archaeological phases of the Late culture, and to translate them into successive protohistoric ethnic situations as we know them from the historical documents.

ARCHAEOLOGICAL EVIDENCE AND INTERPRETATION

In the fuller report giving site data, we have summarized the three phases of Late culture.[30]

The earliest Late culture manifestation, Phase 1, has carried over some of the elements of the final phases of the preceding Transitional culture. But there are also elements which appear here which are completely unknown in the earlier cultures. As the Transitional culture is replaced by that of Late, there are some differences noted in the cultural inventory according to the location.

I have drawn up a sketch map (Fig. 9) outlining various sub-culture areas of our major lower Sacramento Valley region, and will speak of these various areas in the geographical sense. There are distinctions between the inventory of Late culture, Phase 1 in, e.g., the Colusa area and the Delta area. If we assume that these phases are contemporaneous,[31] we note that each seems to be a central point of diffusion of certain traits enumerated below. Thus (see Table I), tubular and disk beads of baked magnesite belong to Phase 1 in the Colusa area, yet do not appear in the sites of the Sacramento, Stockton, or Delta areas until Phase 2. In the southern part of our region (Delta area), the following traits appear in Phase 1, but are not noted in the northern part of the region (Colusa area) until Phase 2: pre-interment burning of funeral offerings in grave-pit; deep angular serrations on obsidian points; bird-bone tubes with incised geometric designs;[32] single piece, bilaterally barbed fishspears; banjo-shaped ornaments of abalone (*Haliotis*) shell; general elaboration in forms and decorative styles of abalone shell

[30] Lillard, Heizer and Fenenga, 1939, pp. 79–82.

[31] Since Phase 1 is the earliest and definitely prehistoric phase of Late culture, it is reasonable to assume that it appeared at about the same time in the valley area wherever it has been disclosed. It was at any rate, in operation throughout our area in pre-Hispanic times.

[32] My colleague, W. C. Massey, has prepared for publication a special report on these decorated objects. His intensive analysis bears out my simple statement of fact.

TABLE 1.—ARCHAEOLOGICAL ELEMENT LIST OF PHASES 1, 2, 3, LATE CULTURE, SACRAMENTO VALLEY. FOR AREAS AND SITES SEE FIG. 9. LAST TWO COLUMNS SHOW PERSISTENCE OF ARCHAEOLOGICAL TRAITS. DETAILS OF CULTURE ELEMENTS IN LILLARD, HEIZER AND FENENGA, 1939.

	Phase 1							*Phase 2*								*Phase 3*							
	Colusa		*Sac'to*	*Delta*				*Colusa*		*Sacramento*				*Delta*	*S.F. Bay*	*Colusa*			*Sacramento*				
	S.3	*S.1*	*S.60*	*S.66*	*C.138*	*C.150*	*250*	*S.1*	*S.2*	*S.60*	*S.56*	*C.6*	*C.107*	*C.127*	*C.138*	*260*	*S.1*	*S.2*	*S.13*	*C.127*	*C.120*	*C.43*	*Patwin*	*Miwok*
Dorsally extended burials	+	+																						
Tubular magnesite beads		+						+	+	+	+	+	+	+	+				+				+	+
Olivella (type 2a) bead caps	+	+					+								⊕									
Olivella (type 2a) beads	+	+	+	+	+	+	+		+			+		·	⊕	+		+						
Type 2 cremation (complete)			+	+			+			+	+	+	+	+		+			+			+		
Type 3 cremation (incomplete)				+			+		+	+	+	+			+	+		+	+			+		
Type A stone mortars				+	+		+				+	+			+	+								
Olivella (type 3e) beads				+				+							+									
Incised birdbone tubes				+	+				+		+	+	+	+	+	+							+	+
Stockton-type square serration				+	+			+	+	+	+	+	+	+	+	+		+	+	+	+	+	+	+
Bone tubes, medially constricted				+						+		+	+	+	+									
Type G ("Banjo") *Haliotis* ornaments				+	+				+	+	+	+	+	+	+			+						
Red paint bed under burials					+		+								⊕	+								
Bilaterally barbed fishspears				+	+		+		+			+	+		+									
Fully flexed burials			+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Clamshell disk beads								+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Olivella (type 3a.1) beads									+	+	+	+	+	+	+			+	+	+	+	+		
Thick steatite disk beads									+	+	+	+	+		+			+						
Hourglass-shaped steatite beads											+	+	+		+									
Type c decoration on shell ornaments								+	+	+	+	+	+	+	+									
Type d decoration on shell ornaments									+			+			+									
Type C.l.d. *Haliotis* ornaments												+			+									
"Claw form" tabs on *Haliotis* ornam.									+			+			+									
Obsidian "Stockton curves"												+			+									
Wooden fishhooks										+		+			+									
Incised birdbone whistle											+	+			+									
Baked clay bird effigies											+	+	+											
Turquoise disk beads															+									
Tubular *Tivela* shell beads												+	+	+	+									
Flat, ovoid, *Tivela* beads												+			+									

ornaments; cremations; and fully flexed burials lying in dug grave pits. The source for magnesite beads (earliest in Phase 1, Colusa area; latest in Phase 2, Delta area) is toward the north in Lake County where the Pomo held a monopoly on the deposit and manufacture of the finished product. Clamshell disk beads, widely known ethnographically, do not appear until Phase 2 in both the Colusa and Delta areas or the intervening Stockton and Sacramento sub-areas. But, they seem to be later in the Delta than in the Colusa area, and, since their source is Bodega Bay and their distribution was effected by the Pomo, it is reasonable to assume their earliest appearance is in the northern part of the valley. Certain traits are common to both the Delta and Colusa areas in Phase 1: *Olivella* bead types 1b and 2a.1; tubular, biconically drilled steatite pipes with enlargement or flange at base; and small, delicate side-notched obsidian arrow points.[33] Table I summarizes these data; upon inspection the differences between the various areas will be seen clearly.

A trio of sites (S.1, S.2, S.3) in the Colusa area are particularly instructive for present purposes. If the reader will consult Table I and compare the S.1 and S.2 columns for Phase 2, he will see that the culture of the latter site is far richer and more varied, yet they were contemporaneously occupied during Phase 2.[34] Comparing the three sites, we find the situation to be as follows:

Site S.3	*Site S.1*	*Site S.2*
	Late Culture, Phase 3	Late Culture, Phase 3
	Late Culture, Phase 2	Late Culture, Phase 2
Late Culture, Phase 1	Late Culture, Phase 1	?
	Transitional Culture	

Phase 2 culture seems to be an outgrowth of Phase 1 at Site S.1; it is in part associated with objects of Caucasian manufacture. On Site S.2, however, Phase 2 culture (see Table I) is more nearly like that of a Delta area site, C.138 for example. In another paper[35] I have made a careful comparison of the cultures of these three sites and concluded that:

Site S.3 (a pure-culture site) correlates completely and exactly with Phase 1, Late

[33] Lillard, Heizer and Fenenga, 1939, p. 80.

[34] As shown by the presence of the same types of glass trade beads and clamshell disk beads.

[35] Archaeology of the Miller Site, Colusa Co., California (MS). See also Lillard, Heizer and Fenenga, 1939, pp. 64–69.

period of Site S.1. Phase 2 of Sites S.1 and S.2 are at variance. The Phase 2 Late horizon of Site S.1 is apparently a local (so to speak, autochthonous) development, while the Phase 2, Late period manifestation on Site S.2 is a protohistoric importation from somewhere further south. Phase 3 (the actual, demonstrable historic period) is represented in both sites S.1 and S.2. Apparently these two nearby villages were inhabited contemporaneously from ca. 1810 (?) to at least 1860, but were in little contact with each other. The cultural differences exhibited and the possibility that the two villages spoke different dialects, or even languages (possibly Miwok, or N. Yokuts or Costanoan) leads me to suspect that this is the explanation of the wide cultural differences in two neighboring villages a quarter of a mile apart.

The probable explanation is that Site S.2 received its Phase 2 population from the south in protohistoric times. They may have been only Southern Patwin originally living in the Carquinez Straits region who, under pressure and with newly acquired mobility accentuated by the horse, saw the road open to retreat north as the means of transporting and preserving their old native forms.[36] This we cannot answer for certain, since the historical documents necessary for proof do not exist, and the ethnographic record is silent. Ethnographic accounts give us very little information on tribal boundaries in the Delta region.[37] In early historical times, the Karquines[38] were located between the main channels of the Sacramento and San Joaquin rivers and along the *southern* shore of Suisun Bay eastward to the marshy area.[39] But von Kotzebue tells us that in 1823 these people were gone. It is interesting to note that Kroeber states Karkin to be a Southern Patwin village north of Suisun Bay. This was formerly the rightful territory of the Suisunes and Ompines.[40] There is, therefore, the suspicion that the Karquines moved north, displacing or living with the Suisunes or Ompines, and that if Karkin is actually a Patwin name, the Patwin may have formerly lived south of the Straits in what we now commonly accept as Costanoan territory. If this last is the case, it seems to support the archaeological indications. There is some evidence to believe that by 1840 there were not a few speech islands of relatively recent condition throughout central California, representing in all probability independent and autonomous native groups shoved out of their former homes some distance away and forced to settle in the midst of people

[36] This is suggested by the type of Phase 2 material culture from Site S.3. It resembles most closely material from south of Carquinez Straits rather than that from sites to the north of the Straits. For example, baked clay objects (Heizer, 1937, p. 39) are present on Site S.2, but absent from Site S.1 and S.3. This is more a Sacramento than a Delta area trait.

[37] See Kroeber, 1908; Schenck, 1926; Merriam, 1907.

[38] Map location shown by Schenck, 1926, Figs. 1, 2.

[39] Handbook American Indians: I, p. 659; Schenck, 1926, pp. 134, 136.

[40] Kroeber, 1925, p. 356; Schenck, 1926, Fig. 1.

speaking a strange idiom.[41] I might give one example in illustration. In 1833 Zenas Leonard,[42] while traversing the Sierra Nevadas near or just south of Porterville, visited a native village, the inhabitants of which told him that about ten years previously they had run away from the Santa Barbara Mission after a revolt against the mission fathers. Bancroft's review of the documents relating to the 1824 revolt of the Channel missions,[43] describes the withdrawal of the rebels toward the Tulares; notes the fact (pp. 535, 537) that all the rebels did not return; and (p.

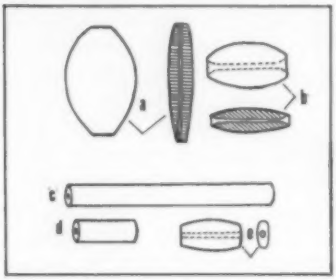

FIG. 11.—Protohistoric *Tivela* shell bead types.

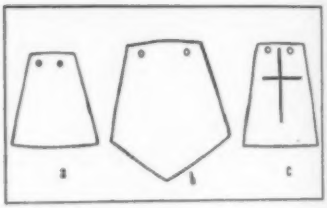

FIG. 12.—Full historic period *Haliotis* shell ornaments.

537) mentions criminal prosecution against the ex-rebels for the theft of certain articles which had not been returned to Purisima—these may be the church objects seen and described by Leonard in 1833.

Another extreme example is that of the Walla Walla (Walula) who came down into the Sacramento Valley to trade for horses. Swan knew a woman who had made such a trip; her mother died and was buried at Sacramento.[44] Sutter's daybook[45] implies with the other accounts that these people had actually settled or were making frequent visits in the valley, since over a period of time they visited at the fort. I know of no ethnographic traits which such foreigners introduced, but archaeologically they might be identifiable by their physical type and burial accompaniments.[45a]

Let us now turn to an archaeological examination of the Delta area. Phase 2 sites here seem relatively few, but are large villages with great

[41] U. S. Geographical Surveys W. of the 100th Meridian, 1879, p. 420.
[42] Leonard, 1904, pp. 229–231.
[43] Bancroft, 1886, II, pp. 530–537. See also Englehardt, 1913, III, pp. 194 ff.
[44] Swan, 1857, pp. 313–314.
[45] New Helvetia Diary, 1939, p. 46. See also Gudde, 1936, pp. 177–178.
[45a] Heizer, N. D. *b*.

numbers of burials. I suspect that in this swampy overflow which was difficult of access and offered a hindrance to Spanish pursuit[46] there occurred in Phase 2 times a concentration of native groups who picked these defensible, retreat positions. Our reason for believing that the Delta area Phase 2, Late culture remains are protohistoric in time (i.e. are post-contact in time) is that there begins to appear here as burial offerings certain types of artifacts which we know to be indigenous to the Santa Barbara area. I have illustrated some of these southern types in Fig. 12.[47] The appearance of a number of elaborate *Haliotis* shell orna-

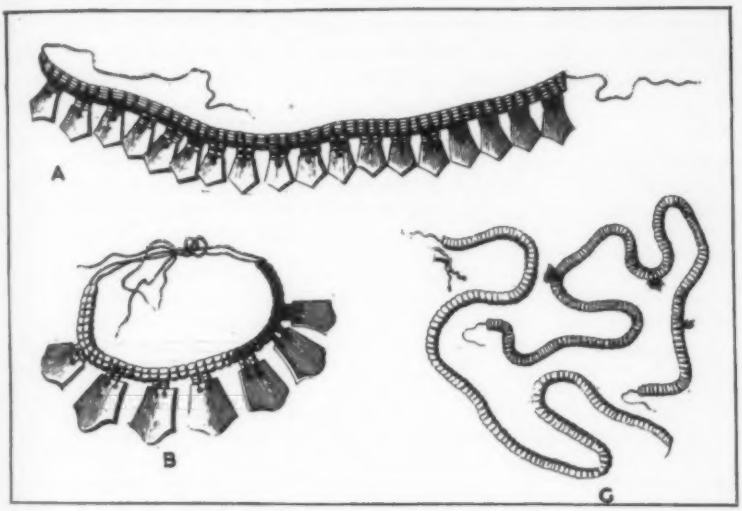

FIG. 13.—Shell bead and ornament types from San Jose, 1806. (*After Von Langsdorff.*) A, necklace of clamshell disk beads and single-holed *Haliotis* pendants; B, same, with two-holed pendants; C, two strings of clamshell disk beads, one with feather tufts. Compare with pendant types in Fig. 12.

ments with fragile side-tabs, incising, and surface-applique of small beads set in asphaltum again point to a Chumash center of origin.[48] The appearance of small turquoise disk beads seems to indicate contact,

[46] On this, see Font's statements in Bolton, 1931*b*, Chapters 16, 17.

[47] Cf. to the Santa Barbara shell specimens shown by Rogers, D. B., 1929, Pls. 36 (top), 71 (lower); U. S. Geographical Surveys, 1879, Pl. XIII; Harrington, 1928, Pl. 26 j–l.

[48] These will be amply illustrated by E. W. Gifford in his forthcoming "Californian Shell Artifacts." The specimens I have reference to are from site C.138.

of a type not recorded earlier, with southern California.[49] The types enumerated above appear in Phase 2 sites, and there is a strong suspicion that the post-1800 flux of peoples, the shifts of habitat, horse travel over long distance,[50] wider trade relations, absorption of new ideas from neophyte deserters from the coast missions,[51] and the increase of epidemic diseases (smallpox, and particularly venereal diseases)[52] which tended to cut down population[53] and probably led to compaction of decimated groups,[54] would lead to mutual exchange of ideas and an increased rate of cultural development in large villages where people, being driven to the wall,[55] were concentrating for mutual protection.[56] This would explain such features of the Late culture, Phase 2 complex, as (1) larger villages, (2) the presence far to the north in the valley of objects originating at Santa Barbara, (3) the rapid spread of the Phase

[49] Found only in one Delta area site (C.138) in a Phase 2 burial. Heizer, N. D. *a*.

[50] Note, for example, the knowledge among the Yokuts in 1819 of what was happening all over the San Joaquin valley (Gayton, 1936).

[51] A careful study is indicated along the lines of estimating the time and numbers of Indians who were deserting. Apparently considerable numbers of neophytes left at times. Bancroft (1884, I, p. 497) mentions 138 deserters from Santa Cruz about 1797; whether in groups or singly is not stated. Cook, N.D., has a chapter on fugitivism.

[52] Venereal diseases were very early prevalent in the southern San Joaquin Valley, (Englehardt, 1912, I, p. 620). Desertions assumed serious proportions (over 200 neophytes) as early as 1795 at San Francisco (Bancroft, 1884, I, pp. 709–711; Englehardt, 1912, I, pp. 499–503). An epidemic disease was one of the factors leading to these desertions (*ibid*., pp. 711–712). Sanchez (1922, p. 276) mentions the Suisun tribe (location shown by Schenck, 1926) which was estimated at 40,000 in 1835. An epidemic disease introduced by the Russians and which lasted from 1837–39 left only about 200 survivors, cited also by James, 1906, p. 274. A smallpox epidemic in 1833 took terrific toll of the Sacramento Valley tribes (Schenck, 1926, p. 131; Leonard, 1904, p. 185; Delano, 1936, p. 140, Wilkes, 1844, pp. 172, 174; Gudde, 1936, pp. 28–29; Torchiana, 1933, pp. 329–330). See also Cook, 1939; Cook, N.D., Chap. on disease.

[53] Torchiana (1933, p. 274) states that the death rate in the missions of baptized Indians was fifty per cent in 1800, seventy-two per cent in 1810, and eighty-six per cent in 1830. Cook's paper (1940) which appeared after this was written corrects these and other figures on mission population given in this article from secondary sources.

[54] The numbers of baptized Indians (33,717 in 1802; 68,218 in 1819; 87,787 in 1832) indicates a heavy drain on village populations. The unconverted remainder in the hard-hit villages of the pagan interior might well amalgamate with the permanent renouncers of Christianity who numbered 1838 in 1802, perhaps 3000 in 1819, and ca. 6000 in 1832. For further data see Cook, 1940; Cook, N.D.

[55] Although this is somewhat beside the point, it is interesting to note Bancroft's (1886, II, p. 120) description of what is clearly a messianic movement among the Chumash in 1801 notwithstanding the fact that it missed fire. Such movements are ordinarily associated with groups who seek such desperate expedients as a relief from what they consider intolerable oppression. (See Heizer, 1941*a*; Englehardt, 1912, II, pp. 613–614.)

[56] Gifford (1926, pp. 391–392) describes such an instance and the social results of such a process for the Miwok.

2 complex over a wide area probably due to horse travel, and (4) a great abundance of burials. This last is an interesting point. Phase 2 cemeteries are often very large and bear evidence to the fact that at times a great number of burials were interred at the same time. The unusually uniform burial offerings running through a large number of graves suggest that a short period of elapsed time would include all the interments. One reason for this may be an exceedingly high death rate due to the introduction of communicable diseases to gentiles by sick mission deserters. A neophyte taken sick at the mission might prefer to meet death in the company of his own people in their wilderness retreat rather than the last sacrament of a priest at whose hands he had suffered ill-treatment, hunger, flogging and overwork.[57]

I have intimated that the Phase 2 complex is a synthetic cultural product explainable in terms of historic or post-contact disturbances. The horse probably was an important factor in effecting this. However, this animal seems to have served more as a source of food[58] than as a riding animal, although the latter use was probably important to judge from early accounts. The question of the horse, how much it was used, how much it was ridden or served as a food animal is another big problem. Horse bones are generally lacking in our sites. This looks suspicious, for bones of feral ungulate animals killed for eating are present, even though rarely. We know, however, that horses must have been known and commonly used; the probability is that they were (at least in the Delta area) not maintained on the spot over long periods of time in numbers. If horses were needed, they could be gotten by raiding the nearest mission herd.[59] The cultural evidence suggesting the presence of wide ranging groups makes it likely that horses were used at least when occasion demanded (e.g. rapid flight, moving a village, visits to far away villages, etc.).[60] The reader will recall Payeras' statements about the extensive use of horses by the Yokuts as of 1817–18. By 1796 at Mission San Jose an order was issued against any Indian, gentile or Indian servant, being allowed to ride horses.[61]

The Delta area, a superb retreat location, seems to have been the forcing bed where the efflorescence of Phase 2 in its main configurations

[57] See Bancroft, 1884, I, pp. 584, 711–712; Englehardt, 1912, I, p. 612.

[58] See Leonard (1904, pp. 184, 221–223) for an excellent analysis of the significance of the horse in relation to the missions and Indians. (Cf. Simpson, 1847, p. 356; Fremont, 1887, pp. 445, 446.)

[59] See, for example, Leonard, 1904, pp. 221, 230; Simpson, 1847, p. 356; Winther, 1935, pp. 22–23; Fremont, 1887, pp. 359, 360, 445, 446.

[60] Beattie, 1929, pp. 343–344.

[61] Bancroft, 1884, I, p. 586, fn. 20. See also Englehardt, 1912, I, p. 425; 1913, III, p. 29.

occurred. The main reason for believing this is the fact that the Phase 1 Late culture complex in the Delta contains many material elements of the later Phase 2 development, elements not known in other areas until Phase 2 times. By consulting Table I the reader will note that the site C.138 (Delta area) Phase 1 complex is similar to that of Phase 2 which differs mainly by the incorporation of the intrusive southern elements discussed above. The Colusa area Phase 1 complex (Sites C.1, C.3) obviously does not contain the germs of a cultural development resulting in the Phase 2 type; actually the latter is intrusive into the area from further south. The tentative boundary drawn between the Stockton and the Delta areas may be more apparent than real, yet there is enough local differentiation between the two to suggest strongly that Phase 2 did not develop in the Stockton area. The Sacramento area is obviously dependent for cultural stimulation and Phase 2 derivation from both the Stockton and Delta areas, more particularly the latter. The Delta-Stockton areas are generally similar, but differ in specific respects, specializations occurring in each area.[62] On the San Joaquin River to the south, judging from the results of a University survey in 1939,[63] true accumulation mound village sites and the general material culture pattern seem to fade out. If this continues to be the true state of affairs, we may eliminate the area immediately south as the Phase 2 culture hearth.

Phase 2 culture, as presented and explained here, had a long enough time for development in the Delta area to assume a characteristic configuration which was diffused more widely. As clamshell disk beads and magnesite beads were diffused from the Pomo into the valley and southward, they reached the Delta area but slightly,[64] more so in the Sacramento and Stockton areas, presumably because they are a late enough feature to have appeared in the Delta area about the time its population was shifting further east toward the Stockton area and even the foothills beyond. Clamshell disk beads, then, definitely ascribable to a northern origin, may become very important time indicators in our Valley area. The Central Valley tribes knew that clamshell disk beads originated to the west. A distribution study of clamshell disk, magnesite beads, bead-counting systems, and linguistic terminology would probably yield significant results, since we know the introduction of clam-

[62] These differences are of the same relative order as those outlined between the Stockton and Lodi areas of Schenck and Dawson (1929, pp. 399–401).

[63] See pp. 123–133 of this issue AMERICAN ANTIQUITY.

[64] On Site C.138, in the midst of a Phase 2 cemetery, is a restricted area where we find a concentration of burials associated with clamshell disk beads. This presumably represents the latest aspect of the Phase 2 remains in this site.

shell beads into the valley was recent. Du Bois[65] says the Wintu bead-counting system was borrowed from the Wintun and may indicate a southern origin of Wintu clamshell disk beads. There is need for a general Central Californian comparative study along these lines. These beads were present among the Coast Miwok when Drake visited them in 1579. In this area archaeology may be able to tell us how old they are.[66] With several streams of influence and multiple factors involved in diffusion we may ultimately hope to achieve certain correlations of material culture types with temporal distinctions.

Caucasian influence gradually becomes stronger and more insistent, the native's retreat progressing accordingly. By 1850 the native population[67] in our area lay mainly in the Cosumnes Valley, particularly in its lower reaches of swampy delta, and later on established Caucasian ranchos, on the flanks of the Sierra foothills, or had retreated far north on the upper Sacramento and Feather Rivers.[68] Finally the reservation system, partial extermination by the settlers and miners, and diseases took their toll of the Indians and we approach the period when the first ethnographers began working: Powers, for example, whose work appeared in the *Overland Monthly* between 1872–1875.

We have not considered the Phase 3 archaeological complex, remains actually associated with European-made objects such as metal tools, glass trade beads, etc. A hard and fast distinction in time cannot be drawn between Phase 2 and Phase 3 remains, since the transition depends only on the addition of Caucasian artifacts.[69] There is presented here another problem, namely, the identification of Spanish-made objects which runaway mission neophytes presumably would carry back with them to the old villages, or which raiding gentiles might steal on the occasion of an incursion against a mission. Such objects are very rare—they do occur occasionally, but normally in sites which also continue into the post-1830 period as signified by Hudson's Bay Company beads. If the Delta area was under recoil impact for about thirty-five years (1790–1825) while the missions (Santa Clara, San Jose, San Francisco) were operating, it is strange that Phase 2 remains (e.g. on site

[65] Du Bois, 1935, pp. 70–71, fn. 38.

[66] Kroeber, 1925, p. 276. Since this was written excavation in Drake's Bay has been richly remunerative in producing a series of five sites containing sixteenth century historical remains. With further work we hope to effect a cross-dating with the Central Valley Late culture.

[67] Judging from the location of sites with datable historic objects and from old maps.

[68] For this period, see for example the 1849 map of the Upper Sacramento Valley by Derby (Farquhar, 1932, map opp. p. 13); Dana, 1934, map opp. p. 113 (1841); Tyson, 1851, frontispiece (as of 1849). Fremont's (1887, p. 517) statements are interesting corroborative evidence.

[69] See Lillard, Heizer and Fenenga, 1939, p. 81.

C.138) do not yield at least a few Spanish beads, knives or metal pieces. Such Phase 2 culture levels do have the distinctive Pismo Clam shell beads (*Tivela crassatelloides*) (Fig. 11) presumably introduced up the San Joaquin Valley via Yokuts tribes. I am frankly puzzled by this apparent inconsistency and offer the following as a possible and partial explanation. A neophyte returning to his old home[70] might carry beads and a knife which would be too valuable to bury with him, and not until later times when beads and knives got more common would they become grave offerings. At this time American trade objects might also be present, and the two, Spanish and American, would be mixed together. Phase 3 remains in the Stockton or Sacramento areas could be interpreted in this way. For example, in site C.117 on the middle Cosumnes river, was found a Spanish silver coin dated 1788, and in the same burial plot, glass beads dating from ca. 1830 together with Chumash type tubular clamshell beads. Our difficulty may otherwise be due to the fact that we have not done enough Delta Phase 2 archaeology. The way, of course, to solve the problem would be to excavate identifiable "rancherias" (a Spanish term for an Indian village) named and located in the accounts in the near vicinity of missions.[71] Site C.138 (the type Phase 2 Delta site) has not produced historic (i.e. Phase 3) remains. Further work in parts of this large site, as yet incompletely tested, may yield glass or metal objects. A group of sites just to the south of C.138 has yielded glass beads in association with Phase 2 type native remains. Farther south and west near Byron we noted, in July, 1938, a locally gathered collection from a single site which contained quantities of small, white glass trade beads found in burials also accompanied by Phase 2 type of artifacts of native manufacture (tubular steatite pipes, stone mortars and pestles, flaked points, *Haliotis* shell ornaments, including the "banjo" form, and clamshell disk beads). Thus, most Phase 2 types, including the shell types of southern origin enumerated above, are sometimes associated with objects of Caucasian manufacture. Phase 3 material culture gradually relinquishes certain Phase 2 elements through substitution of materials, and the utilization of new types. In the Delta area there have been found very few burials associated with articles of Caucasian make; these few are of isolated individuals presumably representing stragglers left behind from the

[70] An Indian might desert from the mission, or sometimes be granted a leave of absence by the priest. (See von Kotzebue, 1814, III, p. 45; Fremont, 1887, p. 362; Englehardt, 1912, I, pp. 264, 554, 556–557.)

[71] This work would yield identifiable Spanish period historic types which could be used to differentiate more distant finds from American and Hudson's Bay Company trade materials.

main movement of the Delta people into the Stockton and Sacramento areas where we find an abundance of sites occupied in the full historic period. This would seem to indicate that the Delta depopulation was entirely completed, or nearly so, by 1825, else Hudson's Bay Company trade beads would be commonly present.[72] Such trade beads are commonly found in the eastern part of the Valley, in the village sites along the Mokelumne River as it debouches into the plain near Lockeford, in retreat positions of the Cosumnes delta, the Cosumnes Valley, along the borders of Stone Lake east of the Sacramento River below the city of Sacramento, and in a number of other places. Wherever historic remains occur, however, they appear to be in out of the way places where the natives sought respite from aggression. Phase 3 times can be generally viewed as beginning with the entry of Hudson's Bay trappers (MacLeod, Ogden, Work, La Framboise, and others) and American mountain men (e.g. Ewing Young, Jedediah Smith, and Joseph Walker), 1827–1835. Characteristic features of Phase 3 include projectile points chipped from bottle glass, magnesite tubes drilled with steel drills, graves dug with shovels, glass or pottery trade beads, steel knives, nails, needles, Dutch ovens, copper or brass kettles, glass bottles, and a few diagnostic forms of *Haliotis* shell ornaments (see Fig. 12). These last are full historic shell ornament types in point of time. I know of none from Phase 2 (protohistoric) burials. It is, therefore, of interest to find that von Langsdorff[73] saw and figured these from San Jose in 1806 (Fig. 13). There is suggested for this type an apparent discrepancy of about twenty-five years between San Jose and the Stockton-Sacramento areas. Perhaps this type originated in the west and spread east in historic times. In possible support of this is the finding at La Grange, Tuolumne County, in the foothills to the east, of some of these (Fig. 12*c*) with a cross incised on the surface with a metal tool (file?). It may have been worn by some former mission Indian who left after secularization. I have omitted treatment of secularization between 1833 and 1837, because we know little about it.[74] It did liberate great numbers of natives, many of whom seem to have reverted to the old life.[75] Between 1834 and

[72] For Hudson's Bay Company dates, see Schenck, 1926, p. 131; Leader, (N.D.). This date (1825) is supported by von Kotzebue (1830, II, p. 141) who said in 1823 that the Tschupahanes and Hulpunes *used to live* in the area about ten miles east of the end of Suisun Bay. He also stated that the Korekines were all gone from the region where the San Joaquin and Sacramento Rivers join.

[73] von Langsdorff, 1814, Pl. opp. p. 226.

[74] See Geary (1934), James (1906), Englehardt (1913, III), and Langston (N.D.) for general information on the disestablishment of the missions.

[75] See, e.g. Wilkes, 1844, pp. 172–174, 208; Simpson, 1847, pp. 318, 353; Hoopes, 1932, p. 37. The "migration" or reversion mission Indians to the Sierran foothills and

1850 there could have occurred, and apparently did occur, a great amount of disturbance and acculturation. This is an important period in the ethnic history of central California, and needs much study. It falls within our Phase 3 archaeological period. Fremont[76] and Derby[77] found many former mission Indians living with the still native southern valley Yokuts in the 1840–50 period. Leonard[78] repeatedly mentions, in 1834, the upper San Joaquin Valley native groups as growing corn and beans and squashes. The whole valley was swarming with herds of wild horses.[79] It is instructive to glance at the names of the Indian "chiefs" who signed the Government treaties in 1851 and 1852.[80] Most of the Yokuts' personal names are of Spanish origin; the farther north up the eastern edge of the valley the treaty-makers went, the higher the percentage of native Indian names. From this fact one can point to the upper Sacramento and Valley foothills as native retreat areas where the old cultural forms were less changed than among the Yokuts.

In summary, we have seen that Phase 2 probably begins as early as 1790 and lasts not later than 1825 in the Delta area.[81] It may be represented as early as 1810 in the Colusa area far to the north. Since part of the Phase 2-Phase 3 complex on Site S.2 is not associated with objects of Caucasian manufacture, it seems likely that the protohistoric culture represented here which was, as we have seen, derived from the south, dates well before 1830, at which time the Hudson's Bay Company men were operating strongly in the Colusa area.[82] I have extended this pre-1830 date back to 1810, twenty years earlier—it is a guess and may be too much. But the Delta population was probably well on the move by 1820, and the Phase 2 (protohistoric) occupation of Site S.2 may have

"Tulares" after secularization may have numbered nearly 8000. Among these were many individuals native to the mission strip (Chumash, Salinans, Costanoans) and there must have been a wide dissemination of coastal elements in the Valley from 1834 to 1850.

[76] Fremont, 1887, pp. 359, 360, 446.

[77] See Farquhar, 1932, p. 257. [78] Leonard, 1904, pp. 189, 193, 230.

[79] Simpson, 1847, p. 406; Farquhar, 1932, pp. 115, 260; Fremont, 1887, pp. 357–359, 443, 451; Leonard, 1904, p. 183; Gudde, 1936, pp. 86–87.

[80] Hearings before the Committee on Indian Affairs, 1928, pp. 44–78. For details on these treaties and the formation of an Indian Policy by the U. S. Government, see Hoopes, 1932, pp. 35–68.

[81] This is a general statement, but the best possible at this time. In isolated spots or on the peripheries of the area there may have been single villages which maintained themselves later than 1825. See the San Francisco Bulletin, Sept. 9 and March 18, 1864.

[82] McLeod, 1828; Peter Skene Ogden, 1829; John Work, 1832. After 1832 there was a Hudson's Bay Company camp just south of Stockton at what is called French Camp today and appears as Campo de los Francescos on the land grant area shown on the U. S. G. S. topographic quadrangle sheet. Intensive trading and an abundance of glass trade beads in local sites probably are of post-1832 date.

taken place as a result of this terminal Delta hegira. The localized cemetery plot in which the burials are associated with quantities of clamshell disk beads at Site C.138 in the Delta area, may represent a trade backwash of one time Delta peoples established in the north. The comparative smallness of this interment area in relation to the very large Phase 2 cemetery, of which it is a part, would indicate that these beads had not been coming in for very long and therefore, that the northward movement of these former Delta peoples had not happened many years previously. The probable explanation is that people who shifted north might keep up contacts with their old neighbors in the Delta and do a little trading when they came down for a visit. Phase 3, distinguished from Phase 2 by the addition of Caucasian-made objects, begins generally in all areas in our region probably about 1830. After this time native made objects become fewer as they are replaced by trade goods. Native patterns apparently were preserved fairly well until 1849 or 1850 in our area and until somewhat later in out of the way places such as Capay Valley in the foothills bordering Cache Creek, at Cool, near Auburn in the Sierras. Reservations absorbed many groups; others settled on American ranches as laborers. Most good ethnographic accounts give some information on the recent history of the group under investigation.

This concludes our inspection of the archaeological, ethnological, and earliest historical data which have produced a partial picture of cultural development in the lower Sacramento Valley and Delta areas for the period 1780–1850. A Delta culture hearth for certain material culture developments has, so far as I know, not been proposed before now. There are a number of good reasons why this has happened: the area was depopulated long before ethnography was possible, and presumably so long preceding the time of inception of ethnographic investigation that little or no memory of conditions of four or five generations preceding was preserved by informants.

Kroeber[82] locates the culture climax of our valley region not in the Delta but farther north on the west bank of the Sacramento River among the River Patwin. Since this climax is objectively determined (by relative numerical weight of culture traits) there is no reason to doubt it. But it is based on non-material culture such as the Kuksu society cults, and cannot be compared directly to the apparent protohistoric archaeological material culture climax operative between 1790 and 1820 in our Delta province. Ethnologically or in later historical times this climax diffused and its boundaries were greatly enlarged. This

[82] Kroeber, 1936*a*, Map 1.

conclusion seems to be a relatively important one to keep in mind when discussing the ethnic situation in the Sacramento Valley-Delta region.[84] If it continues to be supported by further work, archaeology will have to be credited with local culture-history significance hitherto unsuspected and unexploited.

SUMMARY AND FURTHER PROBLEMS

To summarize, the thesis of this paper has been that the period of, roughly, 1780 to 1850 was a time of cultural change and adjustment among the coastal tribes of California as far north as San Francisco Bay, and among those of the interior valley. This new orientation in culture, the fact and content of which is only now dimly seen, was set in motion by the establishment of the twenty-one Franciscan missions strategically situated along the coast from San Diego in the south to Sonoma in the north.

Although Christianization of the coastal natives was successful if judged from the standpoint of numbers of baptisms, it was disastrous in the light of death rate statistics. Most authorities agree that the Indians took to missionization fairly readily, yet local and general revolts were fairly frequent, and from earliest times deserters who wished to return to their wild life and pagan ways were a constant source of annoyance and trouble. As the missions increased in numbers and flourished, there was a constant drain on village populations further and further removed in the interior. The remnants of decimated villages, led by former neophytes who had renounced Christianity and returned to their old homes, consolidated with other similar remnants and withdrew beyond the reach of the Spanish military to defensible, inaccessible retreats such as the Tulare region of the San Joaquin Valley, and the Delta area of the lower Sacramento Valley. Soon after 1800 the tribes of the great interior valley learned to appreciate the horse for its food and riding values. With a common danger the interior groups, now mounted and consolidated, transformed the area, in the words of Fr. Payeras, into a new "Apacheria."

In the pagan villages where different groups had concentrated for mutual protection, there developed (I now speak of the Delta area in the north) through interchange and combination of new ideas, a special type of culture which we have identified archaeologically and named Phase 2, Late culture. With group contacts abetted and stimulated by the use of the horse, together with population movements, this Phase 2 proliferation (dating from ca. 1790 to 1830) spread widely through the Sacramento Valley, and had repercussions as far north as Colusa County

[84] See Du Bois (1939, pp. 114–115) who has realized this situation.

In the preceding pages I have attempted to show some of the factors which led to the unsettled conditions during the proto- and early-historic period in the interior valley among the wild tribes. Among these were the loss of liberty resulting in desertions, the runaways being anti-Hispanic in attitude and action, and inciting their pagan friends to fear and violence; Spanish military expeditions into the interior to recover deserters and for retaliation against attacks on the missions, which resulted in the withdrawal to safer locations of native village sites and populations; introduction of diseases (syphilis, smallpox, etc.) which had disastrous effects on both neophyte and gentile populations; and the use of horses (stolen from mission herds) for food and as a riding animal which led to wide contacts, the introduction of new ideas, the interchange of culture between groups not previously in contact, and facilitated the migration of peoples and actual transportation of their culture.

I wish to state explicitly that I advance this paper with some hesitation. I have been inconclusive and suggestive by intention, not accident. There are still too many lacunae in the data to give reasonable proof of such a protohistoric cultural development in an area for which the ethnographic record is necessarily incomplete. This type of approach based on archaeology promises ultimately to fill certain gaps in the pre-ethnographic picture. But before this can be accomplished, we must perform more work along certain lines discussed in brief below. I have thought the problem sufficiently interesting and promising to make the present earnest attempt at defining it. Much of what I have suggested will be changed, but it seems probable that the broad outlines will stand as presented here.

A primary need is a complete analytical study of all the historical documents having to do with the Central Valley from 1772 till 1860. Schenck's 1926 paper may serve as a guide, although it tends to minimize the important fact of group movements which must be a primary consideration. Next we must have more archaeology, particularly in sites which show the change from Phase 1 to Phase 2 or the transition from Phase 2 to Phase 3 remains. Promising locations for future work are the Delta region as a whole, and the many rancheria sites near the old missions.[85]

Implicit in our postulation of group movements is the plea for anthropometrical work. Physical material from the three phases of Late culture has been carefully saved and is now undergoing careful prelim-

[85] On file at Berkeley are notes on such sites.

inary study.[86] If groups were shifting, we should expect to find some evidence of this in the remains of the people themselves. Theoretically, the Delta physical type might be represented by a single group of emigrants in Colusa area sites. Venereal diseases, particularly syphilis which leaves the signs of its ravages on the bones, was probably present generally in Phase 2 times. A comparison of Phase 1 (prehistoric), and Phase 2 (protohistoric) and Phase 3 (historic) skeletons presents itself as an interesting problem.

I am hopeful that this, together with other recent attempts at explaining the archaeological situation in central California, may be registering their intended thermo-mental effect in thawing the "icy enthusiasm,"[87] an attitude which I myself endorse as necessary. Aside from local interest and incentive to further work along these lines which this study may create, I feel that problems are presented that are similar to those in the Plains area where such significant results have attended the prosecution of the direct-historical approach to archaeology.[88] Therefore, from the methodological standpoint alone the California data may have significance.

University of Oregon
Eugene, Oregon
December, 1940

[86] Dr. T. D. McCown is responsible for this work. The mere mass of material demanding measurement, tabulation, calculation, comparison and written analysis will require time. But it is gratifying to know that the task is begun.

[87] Kroeber, 1936*b*, p. 115.

[88] In certain areas under long historical impact, this type of problem and approach is implied. Its importance to the approach used by Barnett (1940) cannot be denied.

RECONNAISSANCE OF THE CENTRAL SAN JOAQUIN VALLEY

GORDON W. HEWES

A SURVEY[1] of the central San Joaquin Valley has demonstrated a threefold cultural sequence north of Stockton, upsetting the earlier view that central California archaeology lacked evidence of change; south of Tulare Lake are indications of similar cultural stratification.[2] Before the survey the 160 miles between Stockton and Tulare Lake was known only from scattered specimens and occasional correspondence with local collectors.

The area of the 1939 reconnaissance is bounded on the north by the southern limit of Schenck and Dawson's 1929 report, the Mount Diablo Base Line; on the south, by Gifford and Schenck's northern limit, the southern end of Tulare Lake; on the east and west, by the Valley drainage limits. This territory includes the basin of the second largest river in California, and was formerly occupied by the bulk of the Yokuts-speaking peoples, and by some of the Miwok and Mono.

Primarily a site survey, emphasizing surface collection, excavation was only undertaken when material was semi-exposed, thus in danger of destruction. Significant stratigraphic tests, in an area where small "test pits" invite vandalism, would require a larger crew. The work of local collectors proved invaluable in locating sites.[3]

Site distributions indicate the wide range of environments capable of supporting settlement in the area. We mapped and visited 107 sites, assignable to fourteen "regions" on the basis of geography; these regions are not archaeological entities, though artifact inventories from each show significant differences. The sites may be further subdivided into ecological categories, in terms of their relation to food supply; mollusks fish, waterfowl, mammals, and acorns, tule root, pine nuts, buckeye nuts, etc. The densest populations clustered in tule marsh areas and in

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[1] In the summer of 1939 the writer, assisted by William Massey and Graham Schmidt, and on a grant from the University of California, surveyed the Central Valley in an attempt to link the Sacramento-San Joaquin Delta area with the Tulare-Buena Vista Lake region, both already fairly well known archaeologically.

[2] For the Sacramento-San Joaquin Delta see: Schenck and Dawson, 1929; Lillard and Purves, 1936; Lillard, Heizer and Fenenga, 1939; and Heizer and Fenenga, 1939. For the Tulare-Buena Vista Lake region see: Gifford and Schenck, 1926; Stirling, 1935; Walker, 1935; and Wedel, 1941. Gifford and Schenck, 1926, surveyed regions Alpaugh, Lake, and Slough (see Fig. 14*a*).

Bibliography see pp. 141–146 of this journal.

[3] Especially: Mr. Gordon Cain, Coalinga; Mrs. R. Forbes, Avenal; Mr. T. H. Mott, Los Banos: Mr. C. Munger, Tulare; and Mr. O. P. Noren, Reedley.

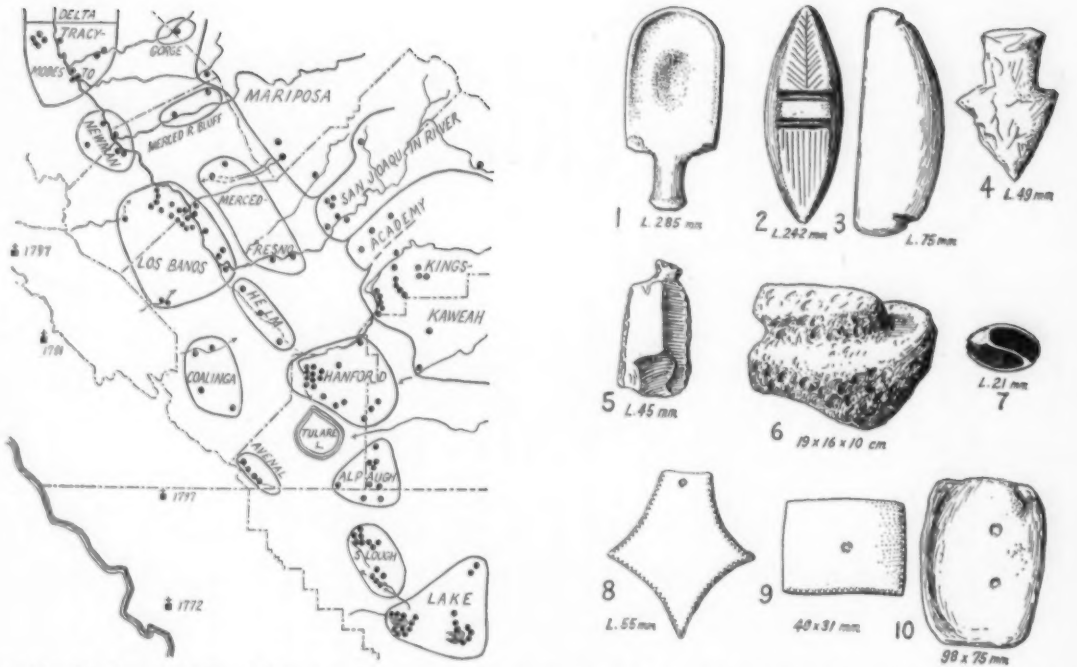

FIG. 14.—San Joaquin Valley, California. *a*, left, map showing sites and regions. *b*, right, artifacts: 1, scoop-shaped diorite, Hanford Region (C. Munger Collection); 2, steatite shaft straightener showing parallel and herringbone incising, Hanford Region (T. Patten Collection); 3, "boat-shaped stone artifact" (atlatl weight?), Kings-Kaweah Region (O. P. Noren Collection); 4, chert, Avenal Region (UCMA 1–51356); 5, chert, corner-tanged, Kings-Kaweah Region (O. P. Noren Collection); 6, unfinished steatite vessel showing tool marks, Academy Region (UCMA 1–51228); 7, ground half *Olivella* shell filled with asphaltum, Coalinga Region (G. Cain Collection); 8, *Haliotis* shell pendant, incised edges, Coalinga Region (G. Cain Collection); 9, as 8, Hanford Region (C. Munger Collection); and 10, *Haliotis* shell ornament, concave side (UCMA).

areas where oaks abound. In the tule marshes, bordering the San Joaquin from its confluence with the Sacramento upstream to its bend at Mendota, and lining the northern shores of Tulare Lake, spreading out in the Kings River Delta, sites tend to be large mounds similar in size and deposit to Sacramento-San Joaquin Delta sites. The tulares supported innumerable waterfowl, mollusks, and fish, together with Tule Elk. In the Sierra Nevada foothills, along creeks and rivers, sites are likewise abundant, testifying, as does ethnography, to very dense population, though here sites are seldom over twelve inches deep, surface evidence being circular house pits and bedrock outcrops containing mortar holes.

The Diablo Range to the west, in the Coast Range rain-shadow, supported a scanty population, concentrated on semi-permanent watercourses well within the foothills; arid conditions did not favor the plants and animals on which central Californians subsisted. However, in comparing the "West Side" of the San Joaquin Valley to the territory east of the axis of the Valley, modern observers are misled by agricultural development. Arid grasslands east of the San Joaquin, were no more favorable to aboriginal population than lands to the west of the river; proximity to foothill water-supply has resulted in a network of irrigation canals, paralleled on the west side only in the vicinity of Los Banos. On the other hand, study of water-supply statistics brings out the fact that run-off from the drainage basins of the Diablo Range creeks from Tracy to Coalinga is but one-thirtieth that of the total run-off of only three streams (Merced, San Joaquin, and Kings Rivers) on the east. Implications of the vast difference in natural water-supply must include aboriginal subsistence possibilities of the eastern and western foothill habitation areas.

The demographical picture, revealed from a study of site distributions, ethnographical data, and Spanish historic accounts, is of dense populations in the tulares, no permanent or semi-permanent settlements on the grasslands. In the bottomlands of the rivers, as they flow down out of the Sierras between low bluffs, settlements were few and small. On the Sierra side, population was more diffuse, since settlements were possible on almost every creek. Kroeber[4] estimates 107.6 persons per 100 square kilometers (i.e. per township, approximately), and a total Foothill Yokuts population almost equal to that of the entire Valley floor of 13,000 square miles. The "West Side," except in the area subject to San Joaquin floods around Los Banos, where tulares prevail, was sparsely settled, perhaps only seasonally. These strictures about West

[4] Kroeber, 1939*b*, p. 137.

Side populations do not hold for Los Gatos Creek (Coalinga region) nor for fairly permanent Avenal Creek farther south.

The largest site, consisting of deposit throughout, was Site 92, Hanford region, with an average elevation above the plain of six feet, diameter 600 feet. Site 81, on a bluff above Panoche Creek, Los Banos region, showed a depth of deposit of eight feet at some points. Diameters of sites classifiable as mounds or midden deposits ran from 100 to 500 feet, though most sites were elliptical. Site 60, Los Banos region, was extraordinarily large; sixty-six circular house pits were observed. Foothill sites showed nothing like the amounts of deposit, but had more evidence of structures; two sites, Kings-Kaweah region, showed twenty and fifteen house pits, respectively.

No important cultural boundaries occurred in our area, and the majority of artifact types from one region can be duplicated, though not always in similar numbers, from almost any other region. There were three major linguistic subdivisions, Penutian Miwok and Yokuts, and the Uto-Aztekan Mono, with dialectic divisions in each, in modern times. It is reasonable to infer similar regional differences from archaeology. It is improbable that all sites surveyed and all artifacts collected represent a single time level.

Disposal of the Dead. The dead were interred in all regions where evidence was collected; no cremations were discovered. Sixty out of 107 sites had burial remains. Foothill sites show few burials, and Driver's ethnography affirms that burials were not made within villages; Valley floor sites are both habitation and cemetery sites. Burial posture is a significant culture horizon index in the Sacramento Delta and Santa Barbara (Chumash) region: the earlier periods with prone extension, later periods preferring flexion, with cremation appearing in the north at the end of the Late period.[5] At Tulamniu Wedel found extended burials only in the "Early" period, flexion in the "Late." None of the seven burials excavated by our survey in 1939, nor a burial in the area excavated in 1937, were prone extensions: all were semi-flexed or fully flexed. There is at least a possibility that further work in the central San Joaquin might yield evidence of change in burial position.

Dwellings and Other Structures. Evidence of dwellings, sweathouses, and assembly structures was of two kinds: saucer-shaped depressions on the surface, diameters ranging from eight to fifty-five feet, with central hearths; and pole impressed, burnt clay lumps. Ethnographically, rectangular and elliptical, as well as circular, ground plans occurred, though we only found the latter. Reports of villages arranged in rows were not

[5] Lillard, Heizer and Fenenga, 1939; Heizer and Fenenga, 1939; Rogers, D. B., 1929.

verified, though aligned houses may have had no floor excavation. Sierra foothills showed most house pits, but, as noted above, the largest number on a single site was in the Los Banos region. The Merced River Bluff region, Site 146, had several small hearths, no depressions or other recognizable evidences of structures. Paucity of house pit remains south of Los Banos and Newman, and the fact that Gifford and Schenck found only one site, in the Alpaugh region, with circular house pit depressions, indicate that this type of dwelling only occurred in the Sierra foothills and on the Valley floor north of Mendota. Similar semi-subterranean houses occur in Late Sacramento culture.[6]

Milling Implements. Portable mortars and pestles used with them show none of the workmanship of the Santa Barbara or Sacramento regions; as in the southern San Joaquin, ornamental, knobbed, or other specialized ends are not found on pestles; mortars are large pebbles, unworked on the outside, or bowl-shaped without special treatment of the rim.The portable mortar is absent in the Sierra foothills, replaced by bedrock mortars in granite, with far cruder pestles, rarely cylindrical. Groups of foothill bedrock mortars range from a half dozen to 500 or more within a few yards of dwelling sites. The Diablo Range, lacking granite, yielded few bedrock mortars. Ethnographically, wooden mortars were used on the Valley floor. In the Avenal region slab mortars and basket hoppers affixed with asphaltum are possibly intrusive from Santa Barbara.

Mano and metate are less common; metates are absent in the Newman, Helm, Coalinga, San Joaquin River, and Stanislaus Gorge regions; manos have wider distribution. Certain flat granite boulder surfaces show shallow, ground areas, definitely not glacial polish, explicable as bedrock metates. Well-made manos are most common in the foothills, Kings-Kaweah, Academy, San Joaquin, and Mariposa. Ethnography suggests simultaneous use of mortar and metate, the former for the greasy acorn, the latter for dry seeds, while archaeology in adjacent areas has pointed to a metate-mortar sequence. Sacramento Delta, Tulamniu, and the Chumash area show that this sequence is expectable throughout central California.

Charmstones and Other Ground Stone Artifacts. Charmstones, regarded by Kroeber as the "one thin thread" guiding archaeologists back from a synchronic view of California prehistory, were rarely encountered on our survey, and only in private collections.[7] No perforated specimens were noted, though they are characteristic of Early Sacramento culture. In our area, plummet-, spindle-, and capsule-shaped types appear;

[6] Heizer and Fenenga, 1939, p. 389. [7] Kroeber, 1936*b*, p. 114.

the first, similar to that found at Alpaugh and farther south, with nipple at the larger end, is most common in the Hanford and Helm regions. Quartz crystals, often large, and red ochre, have scattering distributions, so far not in burial associations. Two Kings-Kaweah sites yielded roughly fashioned stone balls, possibly bolas stones as reported by many Yokuts informants, denied by some Yokuts and all Mono.[8] Two celts, in private collections, from the Hanford and Kings-Kaweah regions may be noted; from the latter, the celt was said to have been found on the edge of a sand hollow in a now extinct channel of Wahtoke Creek. Neither find, without further evidence, need be taken too seriously, though it is not easy to dismiss from consideration two three-fourths grooved axes found near Hanford in 1884 and 1925, now in the museum there. Not improbably, these definitely un-Californian pieces are trade articles from the Southwest, like the piece of cotton cloth from one of the later Pueblo periods found in the Lake region.

Other ground stone forms include a few center perforated stone disks from Tracy-Modesto, Newman, Hanford, and Avenal: Gifford and Schenck found these only at Alpaugh. "Boat-shaped" artifacts, probably atlatl weights, occurred in the Kings-Kaweah region, these are longitudinally grooved on the straight edge, with one or two terminal transverse grooves (Fig. 14*b*, 3). Identical types are figured by Gifford and Schenck from Alpaugh,[9] and in the University of California Museum of Anthropology are four more, two illustrated by Holmes,[10] from the auriferous gravels of Eldorado County, found in 1864. Without subscribing to the vast antiquity originally assigned to these specimens, we may still regard them as possible ancient types not represented in the cultures of the immediate past in central California. Use of similar objects as atlatl weights was suggested by Kidder and Guernsey, and Patterson[11] has made an extensive compilation of their distribution in Texas and adjoining regions. In C. Munger's collection, Tulare, is a scoop-shaped or ladle-like gray diorite or granite artifact from the Hanford region, near Corcoran, almost identical in shape and dimensions to the object found in 1864, sixteen feet deep in auriferous gravels, in Placer County, illustrated by Holmes.[12] Their purpose cannot be imagined, nothing similar has ever been noted ethnographically (Fig. 14*b*, 1).

Shaft-straighteners with transverse grooves, plus incised lines running longitudinally from the edges of the grooves, seem characteristic of the Hanford, Kings-Kaweah regions; we noted seven. On one or both

[8] Driver, 1937, p. 72. [9] Gifford and Schenck, 1926, p. 69, Pl. 192-g.
[10] Holmes, 1899, p. 427, Pl. x. [11] Patterson, 1937.
[12] Holmes, 1899, Pl. 8.

sides of the grooves there may be herring-bone or cross-hatched incising instead of parallel lines (Fig. 14*b*, 2). Gifford and Schenck report three from Alpaugh, and seven from the Lake region. Single and double transversely grooved types, some steatite, with incised designs, are affirmed by Mono, Yokuts, and other southern Sierra groups; use of incised designs for pyrography was noted by Western Mono, Southern Yokuts, and Tübatulabal, Kawaiisu, Panamint, and Owens Valley Paiute. Similar, oval shaft-straighteners are reported in the Chumash area, Salinan territory, and in southern California and the Southwest generally.[13] Uvalde County, Texas, yielded a similar artifact, with groove, incised parallel lines, etc. This occurrence in south central California and Texas, plus specific denial from a Yuma informant, suggests spotty distribution, and is provocative: though shaft-straighteners are artifacts with limited formal variability, it is difficult to accept an independent invention, especially when incised lines are taken into account.

Chipped Stone Artifacts. No significant number of types not occurring in adjoining areas were found. Obsidian and chert are the usual materials; Coalinga-Avenal regions are marked by the use of red chert and little obsidian; on the Valley floor obsidian is more common. Stockton-Lodi showed 80% obsidian, Alpaugh and Lakes, 26%. We estimate 50% for Central San Joaquin. Obsidian was traded in either from the east (Mono Lake) or from the north (Clear Lake or the Mt. Lassen area), so that percentages agree with the proximity to sources of supply. Barbed points were rare in the area as a whole. Coalinga-Avenal regions, using red chert, show shouldered points with tapering stems, most types occurring also in Santa Barbara (Chumash) Canaliño or Late Mainland, and in Salinan territory.[14] East of Tulare Lake (the Hanford region), north to the Los Banos and Merced-Fresno regions concave-base, leaf shaped obsidian blades are common. Kings-Kaweah concave-base obsidian blades are most often triangular in outline. On the Valley floor, obsidian blades with exceptionally fine transverse flaking either across the entire face, or short flakes meeting neatly in the center line, are found. Alpaugh resembles Hanford; Lake region seems closer to Kings-Kaweah. Except for Coalinga-Avenal, central San Joaquin chipped stone types agree most closely with the following periods in adjacent areas: Sacramento Transitional, Tulamniu Transitional and Late. Superficially, it appears that special Late developments of Sacramento culture failed to spread southward. Deviants from central Californian types occur in the Merced River Bluff region. The Academy, Kings-

[13] Driver, 1937; Mason, 1912; Drucker, 1937. For Texas: Jackson, 1938, p. 81. Toulouse, 1939, has a full distribution of these straighteners.

[14] Rogers, D. B. 1929; Olson, 1930; Mason, 1912. See Fig. 14*b*, 4.

Kaweah regions yield red chert corner-tanged artifacts like those from the Plains, Southwest, and Texas (Fig. 14*b*, 5).

Steatite. The Central San Joaquin steatite industry does not bear out some views of investigators in nearby regions as to the relation of steatite to pottery, etc. Steatite vessels and sherds occur in the Coalinga, Hanford, Kings-Kaweah, Academy, and San Joaquin regions, especially concentrated in the Sierra foothills (San Joaquin-Kings-Kaweah) where natural steatite quarries, unfinished artifacts showing tool marks, etc., occur, together with concentration of steatite beads, balls, discoidals and labrets (Fig. 14*b*, 6). Gifford and Schenck regarded steatite as one of the few clues to culture change in southern San Joaquin, "possibly entering with the influx of Coast Indians after the advent of the Caucasians"; Wedel's Tulamniu finds show that the development of steatite working was at least pre-Caucasian. Intensity of steatite industry in the southern Sierra may indicate that a Chumash origin for San Joaquin Valley and Sacramento steatite techniques is not in order.

Asphaltum and Bone. Asphaltum and artifacts with traces of it were noted only in the Avenal and Coalinga regions (Fig. 14*b*, 7). Lumps from burials, shell inlays in asphaltum, the use of asphaltum to fix basket hoppers, to slab mortars, etc., are noted; similar asphaltum uses are recorded by Gifford and Schenck for the southern San Joaquin and by Harrington for the Chumash. A possible source for southern San Joaquin asphaltum is the McKittrick tar seep, southwest of Buttonwillow Slough.[15] Bone artifacts were few, due to their easy disintegration on or near the surface of sites. Awls and long bone "hairpins" were noted in the Helm, Hanford, and Kings-Kaweah regions respectively; bone and claw ornaments, inlaid with asphaltum and shell, occur in the Coalinga region. The perforated pins from Hanford resemble the Slough region, Tulamniu, and Early and Transitional Sacramento types.[16]

Pottery. Central California pottery has been well described by Gayton,[17] and our survey added very little to her distributions, and no data on its antiquity in the area. The only suggested addition to Gayton's pottery making groups seems to be the Wechihit territory on Kings River near Reedley, where Mr. O. P. Noren has collected a large number of sherds from a Mushau village site which run the entire color range of the unevenly fired coarse foothill Yokuts and Western Mono pottery. Driver's ethnography tentatively extends pottery making to the Paleuyami Yokuts.[18] Heizer attempted to explain Sacramento Delta baked

[15] Stock, 1938, p. 262.

[16] Gifford and Schenck, 1926, p. 54; Wedel, 1941; Lillard, Heizer and Fenenga, 1939, Pls. 9, 10, 12.

[17] Gayton, 1929, pp. 249–250. [18] Driver, 1937, p. 122.

clay forms as peripheral manifestations of the Southwest pottery area, but in a more recent paper alters his former view, now regarding them as independent developments. Baked clay artifacts of the type Heizer described[19] do not occur anywhere in the central San Joaquin, even in its northmost portions, so the phenomenon must be a stoneless Delta, local feature. As Gayton demonstrated, Yokuts-Mono pottery does not have direct connections with southern California wares, manufacture of which ceases south of Tehachapi Range.

Shellwork. Shellwork ranged from cut mussel shells to elaborate *Haliotis* (abalone) pendants and drilled bivalve columellae (Fig. 14*b*, 7–10). Common shell beads were *Olivella biplicata*, whole or spire-lopped. Small square or rectangular *O. biplicata* were next in frequency, along with great variety of *Haliotis* forms, disks, rectangles, triangles, etc., with incised edges, etc. Late post-white movements among the Indians no doubt initiated exchange of shell as well as glass beads, so ground limpet rings and clamshell disk beads, may be a result of such trade. Sierra foothill sites, disadvantageously situated with regard to shell sources, show far fewer shell artifact types than do Valley floor sites. In Lillard, Heizer and Fenenga's three-fold culture stratification in the Sacramento Delta, shell type changes seem reliable culture period indices, like pottery style sequences in the Southwest and elsewhere. Only those shell bead types which persist through Early, Transitional and Late Sacramento are recognizable in Central San Joaquin. No specifically Early Sacramento forms occur, e.g., small rectangular *Haliotis* beads with two central holes. Characteristic Late Sacramento beads (clamshell disk) appear on our sites, though no Late "banjo" Haliotis ornaments occur. *Haliotis* types of the Coalinga, Hanford, Kings-Kaweah regions contrast markedly with the far more elaborate Sacramento ornaments.[20]

Pictographs and Petroglyphs. Pictographs from the Sierra foothills contained no elements not previously recorded by Julian Steward. Both pictographs and petroglyphs were within a few hundred yards of habitation sites and bedrock mortars. Diablo Range contained few petroglyphs; no pictographs were noted.

White Contact. The main evidence of white contact was occurrence of glass or porcelain beads, in largest quantities in Sierra foothill sites, but absent on almost all Valley floor sites; along the San Joaquin River and in Diablo Range north of Coalinga there was no post-contact evidence. Trade materials distributions agree with the known history of contact.

[19] Heizer, 1937, pp. 46–47.

[20] Cf. Schenck and Dawson, 1929, Pls. 88–90; Lillard, Heizer and Fenenga, 1939, pp. 15–17.

A Spanish bottle found in a Coalinga region burial, at a site identified as Kroeber's "Udjiu," may be the earliest evidence of white contact. Most southern Sierra beads may be attributed to Hudson's Bay Company agents, American traders, and U. S. Indian Commission's agents, in the period 1840–1851. A few hand-painted "Venetian" beads were noted in Noren's Kings-Kaweah collection. Across the mountains to the west lay six Spanish missions, San Miguel, San Antonio, Soledad, San Juan Bautista, Santa Clara, and San Jose; of these, San Miguel, San Antonio, and San Juan Bautista must have been most important to San Joaquin protohistory, the others being nearly inaccessible from the Valley. Mission renegades and expeditions to recover them entered the Valley via Pacheco Pass (into Los Banos region) or via canyons of Los Gatos or Waltham creeks or even more southerly routes, from San Luis Obispo. Moraga's expeditions used Pacheco Pass, as did Munoz.

General problems of chronology cannot be solved by survey. With cultural sequences well established in the Sacramento area and a tentative three-fold division at Tulamniu, plus culture sequences established by Rogers and checked by Olson in Chumash territory, one can no longer hold the over cautious attitude of Gifford and Schenck. Extended burials preceding flexion in Sacramento, Tulamniu (Lake) region, and Santa Barbara (Chumash), three areas with other indubitable cultural interconnections, would lead us to expect similar changes in central San Joaquin. The variety of artifact types from the several central San Joaquin regions can hardly be explained as local synchronous differentiation, from what we know of California ethnography. It is more reasonable to expect further investigation will resolve these differences into temporal differences. Though no artifacts showed marked patination, one site in Helm Region was outstanding for the high degree of mineralization which had taken place in human and other bone found there. This site could be assigned to the last few centuries only by assuming a hitherto unparalleled rate of mineralization, according to a communication from a mineralogist who examined human and animal bone specimens taken at random from the collection made at the site.[21] Other evidences of antiquity for certain sites are formation of alkali crust and deposition of midden material to depths of seven to eight feet

[21] Professor Austin Rogers, Stanford University Department of Geology, authority on fossil mineralization, examined specimens with the following resulting observations. Bone was replaced by collophane (variety of calcium phosphate), had acquired dark blue-gray or purple color, and specific gravity of *2.78*. Specific gravity of unmineralized compact bone is *1.91*, so that the Helm specimens are denser than glass or aluminum. Very few Pleistocene fossils examined in the laboratory of Professor C. L. Camp, University of California Department of Paleontology showed such densities, though some Pleistocene horse remains from an Oregon lake bed showed almost identical coloration.

above the alluvial plain. In some cases, large sites with great depth of deposit occur within a few hundred feet of each other, e.g., in the Hanford region were three sites within one-quarter section with the following dimensions: 400′×250′×72″; 500′×200′×144″; 300′×180′×84″. It is highly improbable three extensive sites were simultaneously occupied by the number of primitive households required to accumulate such amounts of refuse; it is difficult to imagine how three large villages dependant upon hunting and gathering even in a rich slough region north of Tulare Lake could be supported at the same time. More likely is a long history of shifting settlement by the same local group. At any rate such site constellations are most promising for stratigraphic comparisons. Time perspective includes a consideration of changes in types of sites chosen for settlement, and sites occurring in regions now without natural vegetation capable of supporting typical central Californians with acorns, seeds, roots, mollusks, fish, waterfowl, Tule Elk, etc. Finally, existence of an immense (for California) village in the Los Banos region with sixty-six visible house pits may represent the type of settlement established by mission renegades in the early nineteenth century.

The archaeological possibilities of the central San Joaquin are not meager. Abundant sites with deep middens for stratigraphic tests exist in all regions except the Sierra foothills, where lack of deposit is compensated for by clear housepit outlines which could be worked individually. Constellations of large, deep sites in the Hanford region would afford stratigraphic columns from presumably different occupation periods. A pit-by-pit inventory for the village with sixty-six house pits would be unique in central Californian archaeology.

The writer hopes, in conclusion, that local central San Joaquin institutions take up the work of stratigraphic investigation of the abundant sites in the area. There is no reason why California, one of the New World's best known ethnographic areas, should not be known archaeologically as well. Admittedly unspectacular when compared to regions of higher technological achievement, central California contained the densest aboriginal population north of Mexico, outside the Pueblo area, and great diversity of speech groups, with significant historical implications. These considerations hold enough material to merit the attention of archaeologists interested in broad problems of human culture.

University of California
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THE ORIGIN AND AUTHENTICITY OF AN ATLATL AND AN ATLATL DART FROM LASSEN COUNTY, CALIFORNIA

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IN OCTOBER, 1939, an atlatl and an atlatl dart were brought from Lassen County, California, to the Lillard Museum for examination.[1] These pieces had been found in Susanville in the collection of Mrs. McDow, whose husband had obtained them from an Indian, Charlie Paiute, formerly a resident of the Susanville area.

The atlatl is made apparently of willow; is 75 cm. long; averages 21 mm. in width; is 10 mm. thick at the distal end and increases to 13 mm. at the handle. The wood has been stained with a red pigment (a very similar stain may be obtained by grinding hematite, adding water to it and daubing it on wood). It is black and greasy, apparently from dirty hands, at the handle and along the edges paralleling the groove. The atlatl shaft is flattened on top, and is slightly convex an the back. The groove is 115 mm. long and 15 mm. wide. The spur, which projects into the end of the groove, is 10 mm. long and lies flush with the surface of the shaft. On either side of the shaft, at a distance of 100 mm. from the proximal end, is a shallow, open U-shaped notch. There are no marks to show that the atlatl ever bore finger-loops attached at these notches.

As will be seen from this description and from the illustration (Fig. 15), the Susanville atlatl resembles closely the type which has been called San Juan,[2] a type which has been found generally at Basketmaker II sites in the San Juan drainage area, but which has also occurred at sites in western Texas and northern Mexico. It differs from the previously described San Juan type atlatls in being longer and somewhat cruder. There is no evidence that it ever bore "weights" attached to the back of the shaft.

The dart (Fig. 15) is made of cane and had a hardwood foreshaft which has been broken off at the cane. The cane portion of the dart is 115 cm. long and weighs 35.2 gr. With the hardwood foreshaft the length must have been ca. 130 cm., the weight at least 42 gr. Unfortunately, there is no evidence as to whether or not the foreshaft had a stone point. The diameter of the cane shaft is 10 mm. at the fore-end and tapers to 8 mm. at the butt. The nock is V-shaped as though to engage a bow

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[1] The writers are indebted to Harry and Francis Riddell, anthropology students at Sacramento Junior College, who obtained the specimens for study and aided later in interviewing informants. [2] Fenenga and Wheat, 1940.

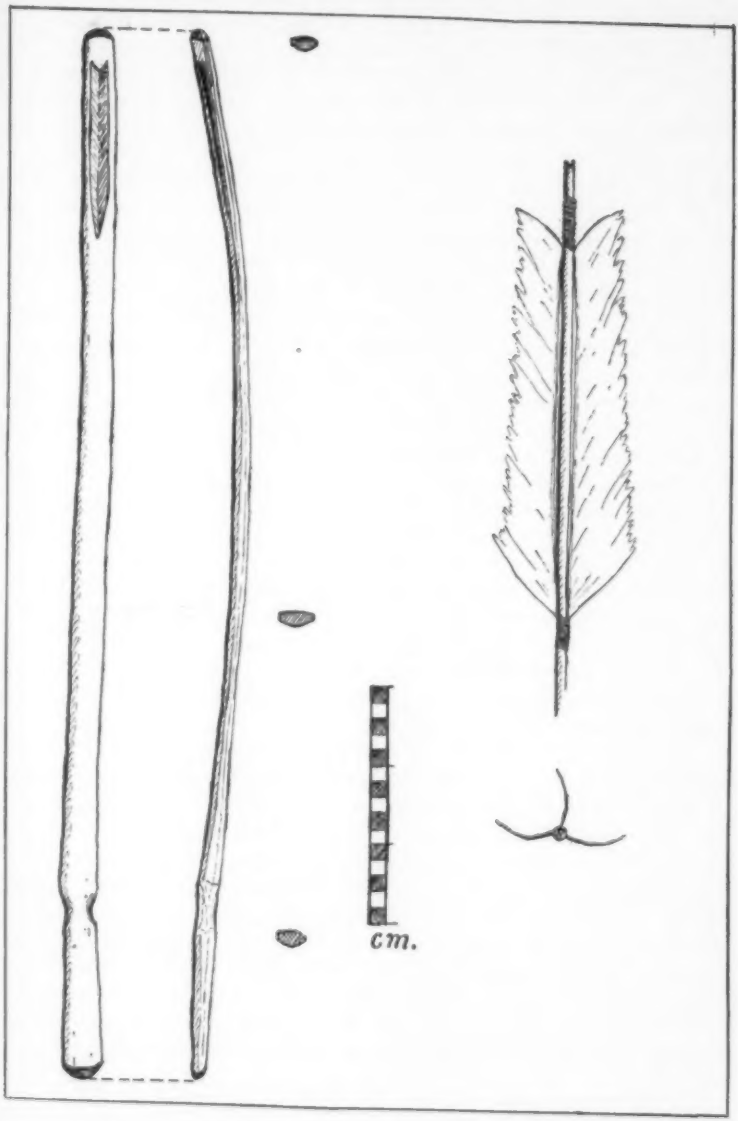

FIG. 15.—Atlatl and atlatl dart, Lassen County, California.

string, not cup shaped as is customary on atlatl darts.[3] It is radially feathered with three split, but untrimmed, golden eagle feathers. The feathers are tied to the shaft at each end by wrapping with sinew, but there does not appear to have been any glue used to affix them. The fore-end of the cane shaft has been wrapped with sinew for a distance of 65 mm. At a distance of 180 mm. from the fore-end, the shaft is wrapped with a band of sinew and a second similar band is wrapped at a distance of 275 mm. from the fore-end. The entire shaft is stained red in a manner similar to the atlatl.

In an attempt to ascertain whether these specimens could have really functioned as projectile weapons or if, instead, they were simply imitations made from illustrations, descriptions, or specimens seen elsewhere, models were made of the implements and after a few minutes' practice, casts of from 150 to 250 feet were readily achieved. It seems, therefore, that whatever Charlie Paiute's original source for the idea of making and using these specimens may have been, it was more substantial than a mere, second-hand description.

The circumstances connected with the collecting of these unique specimens seemed to warrant further investigation and accordingly a visit was made to the Susanville area with the purpose of interviewing all the available informants who might have known Charlie Paiute or who might know something of the old hunting techniques and weapons. Of the people interviewed, only four were of much value: Mrs. McDow, who owns the spearthrower; Mrs. Orrie Evans, a Maidu Indian about 60 years old and a daughter of Charlie Paiute; Mrs. Lena Peconyam, a Maidu Indian about 65 years old; and Lena's mother, a younger first cousin of Charlie Paiute, about 85 years old.

Mrs. McDow is the daughter of Viola Roseberry who was a noted collector of California Indian baskets. She is now in possession of many of these baskets and it was during an examination of the collection that the spearthrower was discovered. Her husband, now deceased, was a Susanville business man who seems to have had a sympathetic personal friendship with many local Indians. According to Mrs. McDow, Charlie Paiute was a Maidu Indian whose home was originally at Big Meadows, Plumas County. He had first left the spearthrower with Mr. McDow "because he had a fireproof building" some fifteen years before Charlie's death, which occurred at Honey Lake on April 9, 1927, according to the Lassen County Auditor, but had returned frequently to get it to go hunting and always told Mr. McDow on his return that he had got his

[3] However, nock-ended atlatl darts may have been occasionally employed, implying a transfer in form from arrow to atlatl dart. Cf. Judd, 1926, Pl. 52*e*, p. 147; Jackson, 1937, pp. 146–192.

FIG. 16.—Sketch Map. [—]=boundary of the Great Basin (after Steward). [O]=archaeological specimens of atlatls: 1, Roaring Springs Cave; 2, Plush Cave; 3, Lovelock Cave. [X]=Susanville. [•]=ethnic groups which deny use of the spearthrower (after Kroeber, 1939*a*).

deer. Mrs. McDow had no idea of the method of using the spearthrower. As a matter of fact, she believed the two specimens to be a bow, minus the string, and an arrow.

Mrs. Orrie Evans, who is one of the four living children of Charlie Paiute, says that he was a Maidu Indian who was born, and lived most of his life, at Greenville in Plumas County. He was a widely noted hunter and fisherman and frequently accompanied white hunters. She thought it unlikely that he had ever traveled as far as San Francisco. She did not recognize the atlatl, even when the specimens were shown her, and insisted that Charlie had always hunted with a gun. Unfortunately, she seemed to have an animosity toward the old culture and something of the same toward other Indians, though she was proud of being a Maidu (rather than a Paiute).

Mrs. Lena Peconyam, although ill when we visited her, proved a willing, even enthusiastic conversationalist, anxious to talk of anything from the old customs to the gossip of the day. By good chance her mother was visiting her on the occasion of our call and while she would talk no English, she talked at length to Lena who translated for us what was said. They both agreed that Charlie Paiute was a Maidu, but Lena thought that Charlie's father was half Paiute and said that this accounted for his cognomen, while her mother insisted that his father was half Washo and ascribed his surname to the idiosyncrasies of the whites. They remembered him as a distinguished hunter and as a guide to white hunters in Plumas County. Both denied ever having seen or heard of the atlatl. They described the bow with obsidian tipped arrows as the weapon for deer and said the only spear used was the *yakám*, a fish spear ca. 10 ft. in length with a barbed bone toggle head.

There seem to be several possible explanations to account for the existence and use of these specimens by a Northeastern Maidu within recent times:

In the first place, it may be a persisting element from old Maidu culture. The atlatl is known archaeologically from nearby areas. Two complete and three fragmentary specimens have been found in southern Oregon,[4] an atlatl dart has been described from Pershing County, Nevada,[5] four atlatls were found at Lovelock Cave,[6] and in the lower Sacramento Valley the bow and arrow seem to have been absent from all but the most recent deposits.[7] While all of these finds indicate relatively great age for the atlatl, several points must be considered; implications from work in the Sacramento Valley are that, so far as material culture

[4] Cressman and Krieger, 1940.
[5] Heizer, 1938*a*. [6] Loud and Harrington, 1929.
[7] Heizer and Fenenga, 1939; Lillard, Heizer and Fenenga, 1939.

is concerned, there was a considerable lag in the mountains as compared with the Valley floor; at Roaring Springs Cave in southern Oregon, evidence for the atlatl was found throughout each of two periods of occupancy, while evidence for the bow was found only in the later of the two deposits; and as for Lovelock Cave, a certain type of twined, flexible basketry found in the atlatl-bearing strata has been made in recent times by the northern neighbors of the Maidu, the Klamath and the Achomawi.[8] That is, we may be dealing with a culturally conservative area in which the spearthrower may have persisted longer than it did in neighboring areas. On the other hand, this seems unlikely in view of the fact that it remains undescribed either historically or ethnographically in spite of the excellence of ethnography done in this area as long ago as the beginning of the century.[9]

In the second place, Charlie Paiute may possibly have learned the use of the atlatl in recent times from someone who was familiar with the San Juan archaeological specimens. He may have been acquainted with several ethnologists, one of whom might have shown him the use of the spearthrower as a stunt.[10] If such was the case, it is improbable that he ever would have gained sufficient proficiency to warrant its use in serious hunting or that he would have shown any solicitude for the specimens, such as leaving them in a fireproof building.[11]

The possibility that the specimens are "fakes" or were intended as a hoax must be considered, but it does not seem that such faking could have lain within the interest or ability of anyone who has had any connection with the specimens.

A second spearthrower, used in historic times, has long been known from California, the one collected in 1793 by Surgeon's Mate Hewett while Vancouver's ships were anchored at Santa Barbara. It is interesting to consider the theories which have been offered in explanation of this specimen. The early writers who dealt with it accepted it as a purely aboriginal part of Chumash culture. Later, Kroeber suggested that its survival might be connected with the cultural isolation of the highland area between Tehachapi and Santa Barbara.[12] Recently the possibility has been proposed that it was introduced by Mexican natives associated

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[8] Kroeber, 1939*b*. [9] Dixon, 1904; Cressman and Krieger, 1940, p. 21.

[10] Occurrences of this sort do come to notice rarely. For example, note the introduction of the Indonesian fire plough among the Pomo through an Indian visiting a Museum demonstration. (Gifford and Kroeber, 1937.) However, we were unable to ascertain that Charlie Paiute had ever acted as an informant for any ethnographer.

[11] On the other hand, if Charlie Paiute made this implement, why should he show such solicitude? If it became lost or destroyed, he might make another. This care implies a uniqueness in his mind for this particular specimen. [12] Kroeber, 1928.

with the Spanish explorers and settlers.[13] This explanation throws no light on the Susanville specimens, because this area received no direct early Spanish (and therefore Mexican) contact.

Fig. 16 presents the ethnic groups who deny, upon questioning, knowledge of the use of the spearthrower. The source of this information is the *Elements Denied by All Informants* section in the numerous Culture Element Distribution Survey reports (published and unpublished) of the University of California. With a few omissions, there is a solid distribution of negatives. We are forced to conclude that the use of the the atlatl is not ethnographically known in this whole area. The problem is, therefore, that of the reliability and interpretation of a single occurrence in the face of such a mass of universal denial. We cannot solve this problem; it may never be solved. But we are convinced of the authenticity of the Susanville atlatl, and we propose that its former owner and user, Charlie Paiute, either collected a similar example from a dry cave and "reinvented" its use,[14] or that he learned of its form and function from some unknown source in historic times. In the latter case, it seems likely that the Indian would have learned also the typical form of the dart which is not nocked, but has a cylindrical socket to engage the spur of the atlatl. The recovery of an archaeological specimen of this general type is, we must emphasize, a distinct possibility in the region, because: (1) dry caves are present in the arid region immediately surrounding Susanville and extending into the area to the east of it; and (2) archaeological specimens of this type have been recovered from sites not too far distant to negate the possibility of their occurrence in the Susanville area.[15]

It is always hazardous to infer the re-introduction of a cultural trait on such slender evidence, but the authors hesitantly commit themselves to this theory. The case is somewhat different from that of the introduction of the Santa Barbara atlatl, since presumably the Chumash

[13] Heizer, 1938*b*.

[14] Although most Indians in the dry cave region of the Intermontaine Plateau (Great Basin) are reluctant to enter these caves, whose location they know, because "they are full of dead people," both the present authors know of instances of modern Indians who dig in them and sell the objects they recover. (Also cf. Guernsey and Kidder, 1921, p. 89.) Charlie Paiute on his hunting expeditions may have found such a cave and recovered a spearthrower from it, a duplicate of which we see in the specimen under discussion.

[15] See Fig. 16 for location of archaeological finds. The finds are from southcentral Oregon (Cressman and Krieger, *op. cit.*), and Lovelock Cave in westcentral Nevada (Loud and Harrington, *op. cit.*). Attention is called to the fact that none of these pieces (Oregon and Nevada Caves, Susanville specimen) has finger-loops, yet all show shallow finger notches. In addition, the nearby Plush Cave specimen from Warner Valley, Oregon, is strikingly like the Susanville piece judging from the handle end.

were instructed by Mexican natives already versed in the manner of its use. We must assume that Charlie Paiute was, in a small way at least, an inventive genius. Certain points, for example his interest in native implement forms as attested by his possession and use of the spearthrower, indicate that had he found an archaeological specimen he might have experimented with it. The results of his experimentation, together with incomplete knowledge, probably account for the use of a modified arrow, rather than a typical atlatl dart which he may never have seen and of which he may never have known.[16]

Lillard Museum
Sacramento Junior College
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University of Oregon
Eugene, Oregon
December, 1940

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[16] The authors believe that future dry cave archaeology may produce evidence of an atlatl similar to the ethnological Susanville type in the area immediately east of Susanville. Such a find, if made, will not prove our guess as presented above, but it would be additional inferential evidence in its favor.

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EXCAVATIONS IN THE CALAPUYA MOUNDS OF THE WILLAMETTE VALLEY, OREGON

WILLIAM S. LAUGHLIN

THE Willamette Valley represents an area that has been relatively untouched by any well-organized archaeological and ethnological research. In 1877, Gatschet did some anthropological work which was mostly linguistic. Mr. J. L. Hill did some work in 1883 in the Calapuya mounds, and Dr. J. B. Horner of Oregon State College has removed many skeletons and artifacts from some of the mounds since the turn of the century. Other than this, most of the work has been done by local collectors.[1] Information of any kind concerning the aboriginal inhabitants of the valley is extremely scarce and disconnected. This is owing to the early shifting of the tribes, their rapid extermination by disease, and the scanty references in the records of the early colonizers and explorers. However, from the existing sources we find that the Willamette Valley was occupied by six or eight Calapuyan tribes and that they had at one time been very numerous and powerful.[2] According to Dr. A. L. Kroeber, the Willamette Valley " . . . is the only interior culture in the Northwest region, and is probably best construed as an inland modification of a form of the primitive river phase."[3] Although it is impossible to reconstruct the social system, much of the material side of the culture does remain, and this has been practically undisturbed by any systematic research. The most important sources of the material effects are the mounds. These mounds are especially numerous, there being more than four hundred, between the present cities of Albany and Eugene, a distance of approximately forty-five miles. They are scattered widely over the Valley floor, but are principally confined to the east side of the Willamette and particularly to the region of the Calapuya River. This type of mound, together with many other traits shown in the workmanship of their artifacts, distinguishes the culture of the Willamette Valley from that of its geographic neighbors.

In view of the fact that the early records of the first immigrants are fragmentary and that the organized research of the past has been scanty, it is necessary to the anthropological history of the Willamette Valley that these mounds be investigated.

The work was sponsored by the Willamette University Department of Anthropology and Museum. NYA assistants, W. H. Nunn and M. H. Cleveland, and student volunteers furnished the labor. The figures were drawn by Nadine Orcutt. Work could be done only on week ends and holidays, and therefore, the extent of the excavations was limited.

[1] Eells, 1886. [2] Berreman, 1937. [3] Kroeber, 1939.

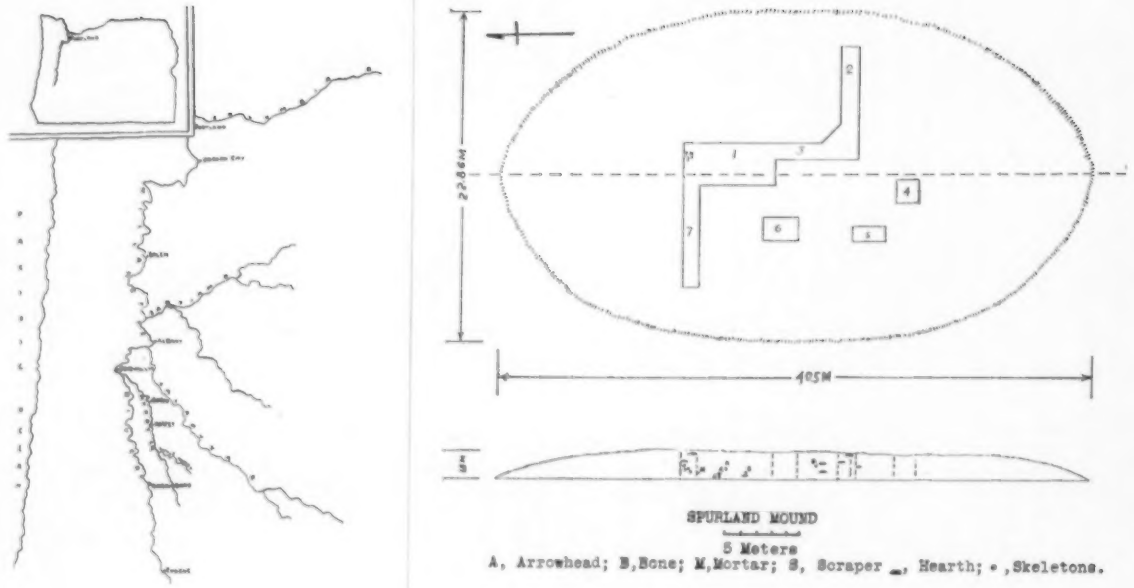

FIG. 17.—*a*, left, sketch map of the Willamette River, Oregon, and its tributaries. *b*, right, plan and section of Spurland Mound, Oregon.

The portion of the Willamette Valley lying between Eugene and Albany, delimited on the west by the foothills of the Coast Range and on the east by the foothills of the Cascade Mountains, is a post-Pleistocene flood plain of the Willamette River. It is dissected by many streams, the largest and master river being the Willamette. The creeks are sluggish and meandering and all drain toward the north. Several of the streams are intermittent. There are numerous dry beds and isolated gullies. In general, it appears that the larger and older mounds are on the banks of the former stream beds, and the later mounds are smaller and are located on the banks of the present-day streams. This was borne out at Shedd, Halsey, and Harrisburg. Much of the stone found in the mounds was brought from the mountains to the east, which are lava-capped and underlaid by tertiary sediments. The remainder came from the Willamette River. The soil of the mounds is a silty, dark loam. The location of a mound in a field that has been plowed for many years is usually noticeable by the distinct soil change from the dark loam of the mound to the lighter-colored loam of the field.

At the present, most of the mounds are thickly covered with brush and large oak and fir trees. They have not been cleared, mainly because of their proximity to streams or dry washes and the consequent difficulty in cultivating them. There are still many acres of camas, which was so commonly used for food, growing in the fields around these mounds.

HARRISBURG MOUNDS AND CAMPSITE

Beginning March 9, 1940, we made nine trips to the mounds and campsite near Harrisburg on the farms of Mr. Frank Spurland and Mr. Miller. The Spurland mound is located approximately two miles south of Rowland. It is on the north bank of a U-shaped gully which may have been originally a part of the intermittent tributary of the Little Muddy, whose bed comes within thirty meters and is itself dry a good part of the year. The soil in the surrounding field is the Amity silt loam,[4] and the soil underlying the mound is the Wapato silty clay. The mound is elliptical in shape with the long axis parallel to the west arm of the gully, lying north and south. It is 40.5 m. long, 22.86 m. wide, and 1.82 m. in depth. There was a dense covering of brush, and several large trees on and around the mound. Because of the limitations of time and labor, we trenched along the north and south axis of the mound, excavating from the top of the mound down to the clay soil bottom. Dr. Gordon Macgregor of the Office of Indian Affairs, who inspected the excavation, suggested a cross-section of the entire mound. However, the outer extremities of the mounds seem to be devoid of any buried material; there-

[4] *Soil Survey of Linn County, Oregon*, No. 25, Series 1924.

fore, we concentrated on the heart of the mound. The primary trench was started on a median line and approximately 15.42 m. from the north end of the mound. It was in this trench that the first skeletons were found. As this was not the center of the mound, we extended our trench to the south to form section 3 (see Fig. 17*b*, top view) and then brought in a trench at a right angle from the east side of the mound. Trench 2 was 7.62 m. long and met extension number three of Trench 1. At this point of intersection the mound was 1.82 m. in depth, this being the deepest part. On the bottom of Trench 2 we found the skeleton of a young person. Because of its position, it was probably the first burial. Throughout the mound there was worked material such as flakes, fractured rock, ashes, fired rock, broken bird and animal bones, in addition to the artifacts such as arrow points, knives, scrapers, drills, skin dressers, etc.

The skeletal material of the Spurland mound consists of five skeletons and fragments of a sixth. At the north end of Trench 1 the first skeleton was encountered at a depth of 1.06 m. It lay in a flexed position on its side with the head to the west. Around the neck were strands of a dentalium and copper necklace. The dentalium was in three to seven millimeter sections, and the copper beads were rolled sheets about 36 mm. in length. Also some of the rawhide and fiber string was preserved, and a remnant of what may have been a bearskin robe around the throat. The copper beads had disintegrated and oxidized to such a degree that they had saturated the strings, leather, and hair with copper salts, and in that way preserved them from deterioration. The skeleton was that of a male. The teeth were worn well into the crowns. This, together with the condition of the sutures, indicates that the person had advanced well along in adult life. The occipital region of this skull had been artificially flattened.

The second skeleton was found at a depth of 1.2 m., slightly above No. 3 and to the north 15 cm. It lay near the feet of No. 3. The skeleton was of a child not yet two years old. It was not possible to ascertain the position in which it had been originally placed.

The third skeleton was found slightly deeper and 60 cm. to the southwest of No. 1. It was lying in a flexed position on its right side and with the head to the west. It was also of a male, of much more massive structure, but not particularly large. According to Dr. Aleš Hrdlička of the United States National Museum, who examined the skull, it was above average in thickness but not uncommon for the Pacific coast. The skull had been broken, perhaps by a burrowing rodent.

The fourth skeleton lay to the west of No. 1. It was on its left side, and the limbs were also drawn up in a flexed position with the head to

the west. The teeth suggested that it was probably a male, fifteen or sixteen years old. Around the cervical vertebrae was a shell necklace. It was composed of four different kinds of marine shells, as identified by Dr. W. T. Edmundson. The majority were *Olivella biplicata*, several were clamshells, a few were oyster shells, and there was also a pendant of abalone shell. They may have been traded from the coastal Indians of California.

The fifth skeleton was found in Trench 2 on the clay bottom, the depth of the mound at that point being 1.82 m. It was the skeleton of a child of about ten or twelve years of age. It lay on its left side in a flexed position, but in distinction to the other skeletons, it was laid with the head to the east. Being on the bottom it was probably the first burial of the mound.

A skull cap and portions of a femur were found in Trench 1, but were isolated from any other bones or artifacts.

Bone artifacts were scarce. One bone chisel was recovered. It was well formed, 8.2 cm. in length with a cutting edge of 7 mm. Fragments of other tools were found, some of which were probably flaking tools. Two socket handles hollowed from the base of antlers, probably used for chipped knives, were discovered at a depth of 1.5 m. Fresh water mussel shells were found near the surface of the mound. The shell necklace from skeleton No. 4 was the only other evidence of the use of shell.

The most common chipped artifacts were the arrow points. These were made of obsidian, variegated obsidian, jasper, chert, and chalcedony. There was quite a variety of forms, but SCa2 and SAa[5] seem to predominate. Most of the chipping is of fairly good workmanship. Two drills, one knife, and an end scraper of petrified wood were found at various places in the mound. The petrified wood scraper came from a fire hearth close to the surface of the mound. Other arrow points and scrapers were removed from the bottom of the mound (see Fig. 18*a*).

One small sandstone mortar (Fig. 18*b*) was found in Trench 1 at a depth of 1.2 m. Other fragments were found. The pestles found showed working only on the ends. Stone anvils or mauls also were found. They were worked only in the middle.

MILLER MOUND AND CAMPSITE

The Miller mound of the Harrisburg group lies on the opposite bank of the same gully. The mound is 33.5 m. long and 19.2 m. wide and approximately 2 m. deep in the center area. It lies east and west parallel with the base of the gully. It is covered with brush and several large trees. One of the oak trees on the mound was estimated to have an age

[5] Strong, 1935.

of 350 years. This mound was not systematically excavated, and no records were made. Three skeletons were removed by one collector. They were reported to be lying in the usual contracted position with their heads to the west. In 1936, a group from Willamette University excavated the northern side of the mound and recovered one skeleton. It lay in a flexed position, the head to the west, and had an arrow point in the palm of the left hand. This was at a depth of about 1.5 m. A few arrow points and scrapers were found throughout the mound, but in no definite concentration. Fire hearths were encountered at different levels but contained only the usual ash, charcoal, and bone. One interesting piece found in the mound was a fossil mollusk. It was probably Oligocene, according to Professor Herman Clark of Williamette University. The nearest known fossil deposit is in the lower sediments of the foothills of the Cascade Mountains.

About 200 m. to the southeast and on the southern bank of the intermittent tributary of the Little Muddy creek is a campsite. The occupational material covers a distance of several hundred feet and is found 30 to 40 m. from the creek. We dug two trenches at a distance of about 30.4 m. from the creek and went down to where the soil changed from a Willamette silt loam to a sandy loam. We found many chips of chalcedony, jasper, obsidian, and chert, as well as much fractured igneous rock. A few arrow points, scrapers, and a pestle were found here. Occupational material in the form of flakes could be found at any place on the site.

HALSEY MOUND

In December, 1939, and January, 1940, we made two trips to a large mound on the farm of Mr. C. E. Corben. This mound was approximately three miles east and two miles north of Halsey and was near the edge of a flood plain of the Calapuya River. It was 47.2 m. long, 33.5 m. wide, with the long axis running northwest-southeast, and covered with brush and trees. We made a large trench in approximately the center of the mound. All of the usual characteristics were present, the fire hearths, flakes, and fractured rocks, bone splinters, charcoal, etc. In the lower part of the mound we found human clavicles and tarsal bones. These, together with a few vertebrae, were the only scattered traces of the burial remaining. In the second trench, we found bone tools, usually skin dressers made of antler. The lowest was at a depth of 1.4 m. Also in this trench were found a few of the bones of a young child. This mound, because of its size and the workmanship of the pieces found in it, should be thoroughly excavated.

Bones of two skeletons, an adult and a child, were removed. The bones were found at a 1.5 m. depth. According to a former owner, the

FIG. 18.—Willamette Valley, Oregon. *a*, chipped artifacts from bottom of Harrisburg Mound; sandstone arrow-smoother from Halsey Mound. *b*, sandstone mortar from Harrisburg Mound. *c*, bone artifact from Halsey Mound.

place was originally purchased from the Indians. The two Indians who sold the land were allowed to live on the mound until their death in 1840, and were then buried in the mound by the white owner.

Many worked pieces of bone were found, some grooved and polished, but no complete specimens. Some of these pieces were probably part of flaking tools and awls. The horn artifacts consisted of flaking tools, wedges, and skin dressing implements (see Fig. 18*c*). These were made from antlers, and the working edges were polished.

Some of the arrow points were of very good workmanship. Sb and SAa[6] were most common. The arrow points and scrapers were made of jasper, obsidian, chert, chalcedony, and some basalt. Most of the scrapers were the simple end or snub-nosed type. The stone work of this mound was unusually well-polished. Pestle and mortar fragments were the most common. One small, sandstone arrow-smoother was found (see Fig. 18*a*).

SHEDD MOUNDS

In February, 1940, we made one trip to the mounds northeast of Shedd. The two mounds investigated were on the Carl Arnold farm. The mounds were on the west bank of the Calapuya. The first mound had been plowed for several years and only a slight rise was noticeable. However, the dark soil of the mound contrasted decidedly with the lighter soil of the field. We removed a badly disintegrated skull from a depth of 40 cm. A few scrapers and chipped pieces lay on or near the surface of the mound.

The other mound had been eaten away by the cutting of the Calapuya River until only 15.2 m. of it remained. It also had been plowed and was very low. A test hole indicated the usual chips and fragments found in the other mounds. On the surface we found a part of the rim of a mortar with a geometrical V design incised around the edge. Several years ago, a burial had been removed from this mound, a skeleton, with two mortars, pestles, and several arrow points. In one of the mortars an obsidian blade, 25.5 cm. long, of very good workmanship, was found, broken in three pieces. The mortars are at the home of Mrs. Tempa Brock. One of them was nicely decorated with a raised V design.

There are more mounds close by that have not been opened and are certainly worth investigation.

CONCLUSIONS

Several of the sites investigated by field parties of Willamette University have yielded evidence of their connection with the historic Calapuya tribes living in the valley in historic times. Lack of stratifica-

[6] Strong, 1935.

tion or marked cultural differences leads us to believe that these mounds, a great many of which are known in the region, may be ascribed to the Calapuya Indians.

The fact that occupational material is strewn promiscuously throughout the entire mound would indicate that the soil may have been originally taken from around the campsites on the stream banks. The burials were at different levels and this, with the few fire hearths and lack of concentration or stratification of occupational material, suggests that the mounds were used for successive burials and only temporarily for habitation at any one time.

However, the size and shape of the mounds, the presence of occupational materials, scattering of fire hearths, and burials throughout the mound at different levels indicate that the mounds were probably campsites. The streams of this area overflow in the winter, and consequently, it would have been of advantage to have the campsites elevated.

In general, these mounds contain many pieces that are of great significance to the reconstruction of the culture of the Willamette Valley, which cannot be achieved until careful and extensive investigations have been carried out.

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OBSERVATIONS CONCERNING THE "RED PAINT CULTURE"

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FOR many years the people of Maine, parts of New England, and the Maritime Provinces have been told that an ancient group of Indians lived in the northeastern part of the United States and later moved into New Brunswick and Nova Scotia. These ancient people have been called the Pre-Algonquian Group, The Red Paint People of Maine, and the Beothuk of Newfoundland, by various archaeologists who have excavated their graves.

These archaeologists have come to the conclusion that the graves represent a very old group of Indians, but they have not agreed on who they were, where they came from, or where they went. Mr. Charles C. Willoughby shows the distribution of the pre-Algonquian culture as covering all that portion of North America east of the Great Lakes, along the Saint Lawrence River and as far south as the tip of New Jersey.[1] Dr. Warren K. Moorehead states that they lived, for the most part, in Maine and that only scattered burials have been brought to light in territories adjacent to Maine.[2] He is rather emphatic in pointing out that these people are not the Beothuk of Newfoundland. Mr. Walter B. Smith, who accompanied Dr. Moorehead on many of his trips and who did work by himself, advances the theory[3] that these people might have lived on the coast of Maine when it extended much farther into the Atlantic Ocean than at the present time. He points out that violent disturbances may have inundated the land with great tidal waves killing many of its inhabitants. Those who were not lost came to what is now the shores of Maine where they lived until they became extinct. If such disturbances did take place, geologists have not recorded them since the last great ice cap.

It will be noted that the archaeologists cited do not arrive at a definite conclusion as to where these people came from or where they went. Neither do they agree on the extent of the territory occupied. They all agree, however, that the graves are of great age and were made before the advent of the Eastern Woodland Indians. The assertion of age is based on two facts: (1) the outlines of the graves are indistinguishable, and (2), with the exception of a few graves, no bone material has been found.

Because re-stratification had taken place in and about the graves so that no one was able to tell where the graves began or ended, the con-

[1] Willoughby, 1935. [2] Moorehead, 1922. [3] Smith, 1929.

clusion was made that such a condition could not have been found until the lapse of great time. It must be admitted that re-stratification does not take place within a year or so, but the kind of soil and the climate will determine the element of time. Some soils will re-stratify with the surrounding soil within eight to ten years so that it is not possible, except for the trained observer, to tell where the soil had been formerly disturbed. As most of the graves of the Red Paint People have been found in sandy loam or gravel, we should bear in mind that such types of soil require little time to re-stratify. The heavy spring and fall rains of the regions where the graves have been found would tend to hasten the process of re-stratification, especially as the graves have been found on hills or bluffs near rivers or lakes where the action of the rains is more rapid than in lower lands. There is no doubt that the archaeologists, who worked on these graves, did not see a line of junction between the disturbed and undisturbed soil, but the absence of such a line is not necessarily a criterion showing great antiquity.

The absence of bone material in the graves does not seem unusual for here again the sandy loam or gravel does not preserve bones as well as heavier soils which would prohibit the rapid percolation of the rains and melting snow.

Mr. Smith is the only archaeologist to state definitely that he has found a village site of the Red Paint People. Describing a village site a few miles from Bangor on the Penobscot River, he writes: "While certain relics and many fragments indicate a Red Paint period village, many other objects are surely identical with those of more recent stone-working tribes."[4] No attempt was made to group the artifacts with the horizons from which they were taken, and it appears that specimens of the two cultures were found throughout the various depths of the village site.

How Mr. Smith came to select this village site as belonging to the Red Paint People is not clearly shown. It appears that he found only artifacts which were similar to those found in their burials and chips of artifacts of the materials used in the manufacture of their grave goods. The presence of other stone objects, together with potsherds, points to the fact that a later group of Indians had also lived on the site, but he did not note that there was a horizon where only Red Paint artifacts were found and another horizon where those of another culture were present. It seems to me that Mr. Smith found a village site of the Eastern Woodland Indians where they made and used artifacts similar to those from graves known as Red Paint burials but, in reality, the burials were those of the braves and chiefs.

[4] Moorehead, 1922, p. 134.

If the persons who have been looking for village sites of the Red Paint People had looked for less perfect specimens, I feel sure that a striking resemblance between the grave goods and the artifacts of the shell heaps and known village sites of Maine would be seen in the workmanship, materials used, and in the pattern of the artifacts themselves.

Most of the chipped implements taken from the graves have been classified as knives or projectile points and only in a few instances as arrow points. As many of the chipped implements are too large to be used as arrow points, it has been thought by some archaeologists that these people did not have knowledge of the bow and arrow. The large blades have been played up to such an extent that the smaller ones have been overlooked, but among the chipped implements taken from graves there are blades that may be classed as arrow points of the notched, straight stemmed, and triangular types. The materials used in the manufacture of the blades have been found in Maine, with the exception of translucent quartz. It has been suggested that this material came from Labrador, but quartz known to have come from Labrador is, actually, much darker, while the chipped blades are of a quartzite very like that found in New York State. There may be other sources of this material.

The polished slate points found in great numbers in the graves are not numerous in shell heaps. However, they were probably ornamental points for they break very easily and could not have withstood the strain to which a hunting blade would have been subjected. The same might be said of the translucent quartzite blades which I have seen broken merely by the careless handling of Indian owners. It must have taken hours of labor to make such an implement, therefore it seems probable that good care was taken of it until it had served its purpose. Many segments of long slate projectile points similar to those taken from graves have been found in shell heaps, and, considering the ease with which they may be broken, it is not surprising that few unbroken ones have been taken from these camping sites. It is very probable that such artifacts were used as ornamental implements in ceremonials, which would account for their presence in graves.

It has often been stated that none of the great varieties of adzes found in the Red Paint graves have been found in the shell heaps. While it may be admitted that they have not been found in great quantities, a few complete and many broken adz blades showing the expert workmanship of the Red Paint People have been brought to light throughout the various horizons of the shell heaps. From all appearances, most of the adz blades from the graves were intended for use in woodworking, such as the manufacture of dugout canoes. If they were used for this purpose, it is not surprising that we do not find more of them in the

shell heaps. One might expect to find them in village sites along river banks where trees of suitable size for the manufacture of boats could be found and many such implements, as finely made as the adzes of the Red Paint graves, have been picked up on the river banks of Maine as surface finds.

Grooved and grooveless axes have not been thought of as a product of the pre-Algonquian group as they are not reported from the graves except in one or two instances. Many celts or grooveless axes have been found in the shell heaps but of all the grooved axes in the Robert Abbe Museum, Bar Harbor, Maine, only two can be associated in any way with shell heaps; the rest were surface finds from the banks of streams below or above carries. Over a year ago, many graves were dug on Indian Island, Old Town, Maine, and over five hundred artifacts similar to those found in some of the so-called Red Paint burials were brought to light. Among them were two grooved axes and many celts or grooveless axes. Mr. Willoughby does not mention such artifacts for the pre-Algonquian Indians; Dr. Moorehead admits that he has found several implements which might have been used as axes.

The artifact that has been played up as a product of this old culture in Maine is the sinker, fish lure, or plummet. In the past few years, I have found over eighty-five plummets on river banks and shell heaps. Over seventy have come from two shell heaps at the head of Frenchmans Bay. I have heard of other finds in shell heaps of Maine in sufficient quantities so that there cannot be any doubt but that they were a part of the equipment used by the builders of the shell heaps. Up to a few years ago it was thought the shell heap builders did not use plummets but with the recent finds they are established among the inhabitants of the lowest horizons at least.

It has been said many times that the people buried in these old graves had no knowledge of pottery making. It is assumed by the writer that this statement has been made on the negative evidence of potsherds in the graves, but it does not seem strange to me that cooking utensils are not found buried with hunting implements. Baked clay plummets have been taken from these graves, four of them from Indian Island, Old Town, Maine. If a careful study was made of all plummets from these old graves, I am sure other baked clay plummets would be found which were not formerly recognized as such.

At this time, it may not be possible to prove conclusively that the grave goods which have been discussed were of chiefs and braves of the Woodland Indians, but I feel sure that as more archaeological work is carried on in Maine, more and more evidence will be found of a close

relationship between these grave goods and the ordinary artifacts of the Eastern Woodland Indians.

It has not been the intent of the writer to disparage the age of the Red Paint graves, but to point out that, whereas some of them may be very old, others could have been, and probably were, made after the arrival of the first white men to these shores.

At Indian Island, a lead shot of the size used in the early colonial period muskets was found in a grave with five plummets, three translucent quartzite spear points, and three adzes. That this shot was buried with the other grave goods or was in the body of the dead person was borne out by the fact that it was found completely covered with red ochre. A few feet from this find was another object made of iron, fashioned to the likeness of a bearded human head, with a ring in the top, which might have been worn suspended from a cord. As in the case of the shot, this ornament was buried with other typical Red Paint artifacts and completely covered with red ochre.

At Seboomoock, Maine, on Moosehead Lake, many artifacts of the Red Paint People have been found. Dr. Moorehead saw these artifacts and told me that without a doubt some of them were made by the Red Paint People but other of the finds were of a later culture, presumably he meant the Algonquian. How he came to the conclusion that they were representative of two cultures it is hard to tell, but it must have been because some of the artifacts were not as well fashioned as others. I have seen all of the artifacts and the place from which they were taken. It would be difficult for me to class them as of two cultures since they cannot be segregated either as to size, material, or type of artifacts. They all came from one place on the shore of the lake, the greatest number having been found when the lake was at its lowest level. This place may have been a camping ground of the Indians before the head of the lake was dammed, raising the level of the water. The water has washed away the banks showing refuse and fire pits about which many of the artifacts have been found. The center of the camping ground is in all probability overflowed as we very carefully followed the fire dirt and refuse pits and found they did not extend over three feet into what is now the bank of the lake.

More of the so-called Red Paint artifacts are being discovered on the river banks and shores and lakes of Maine each year, proving that these people inhabited not only the coastal waters but roamed over the entire area of Maine. Most of the artifacts that have been found in the northern part of the state have not been taken from graves but have been picked up as surface finds or found with artifacts of the Eastern Wood-

land Indians. As no excavation of village sites in the interior of northern Maine has been carried on up to this time, I feel that we have jumped at conclusions which may prove to be false when a complete study of Maine archaeology is made. In view of the lack of agreement concerning the Red Paint People of Maine, their artifacts, and the territory they occupied, it might be well if archaeologists were most careful in watching for artifacts similar in pattern, materials, and method of construction to those of the Red Paint artifacts. It may well be that many items thought to be of Red Paint origin are in reality examples of fine workmanship by Eastern Woodland Indians.

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Abbe Museum
Bar Harbor, Maine
January, 1941

FACTS AND COMMENTS

THE FUNCTION OF PADDLE AND ANVIL IN POTTERY MAKING

Recently I published a brief notice on constructional methods in pottery making,[1] which occasioned a number of interesting comments. The majority of the communications and verbal discourses centered upon the seeming error, on my part, "to exclude the paddle and anvil manipulation from the suggested classification." It will be recalled that the notice in question stated: "On the basis of the work thus far accomplished, the following classification of *strictly manual* building methods of constructing pottery vessels may be suggested."[2] The emphasis on *hand manipulation* and the express limitation to *building procedures* appear to have made little if any impression on some readers. It seems in point, therefore, to outline briefly the function of the paddle and anvil in pottery making, as derived from my studies of literature and specimens, as well as from certain empirical knowledge. Admittedly, this note does not pretend to settle any problem nor to be conclusive; rather its aim is to call attention to the need of accurate technical detailing.

The process usually designated as "coiling with paddle and anvil" may be illustrated by the practice of the Southern Diegueño as described by Rogers:[3]

> Coils average about twelve inches in length, regardless of the size of the piece under construction . . . . The [first] coil is fastened to the base by pushing a small section of it over and on to the outer wall of the base with the left thumb, at regular intervals of one inch, while the right hand feeds the coil in the clockwise direction . . . . If the coil is not sufficiently long to go around the base once it is spliced with part of another coil . . . . Spiral coiling, as in the Puebloan technique, is unknown; and each coil is a unit concentric to its predecessor. *After the bonding process is completed the coil is beaten flat with the paddle.* (Italics are mine.)

Obviously the tectonic principle of this procedure depends on the circuit variant of annular construction, the unit being either a single or a composite fillet.[4] The paddling itself is a distinctly separate step which follows the actual tectonics involving the placement, adjustment, and the bonding of the fillets. It is patent that the potter does not "coil with the paddle," but that she merely beats the incorporated, i.e. built in, fillets flat *subsequent* to the constructional manipulation.[5]

A revealing example of confusing the constructional steps with other processes of distinctly different functions appears in Spier's work on the Havasupai:[6]

> Cylinders, 2 cm. in diameter, are rolled out between the palms and coiled in a clockwise direction on a tray basket, patted on top the while with a small, smooth stick to make them adhere . . . . When the flat coil reaches a diameter of 20 cm. the sides are built up by coiling in the same manner; the potter supporting them with a smooth, round pebble inside while the exterior is paddled.

Viewed indiscriminately, the case of the Havasupai, as described by Spier, might well be considered to illustrate "coiling with the use of a stick (paddle) and pebble (anvil)." A critical examination of the citation reveals that the use of the stick, obviously for the purpose of bonding, was unmistakably a *post-constructional* process. It is evident that the basal part of the embryonic vessel was built by plano-coiling, i.e., that the fillet was coiled *spirally around itself*. The construction of the wall, although specified by Spier as "coiling in the same manner," could not possibly be attained by plano-coiling; *if*, in the construction of the wall proper, the fillet was carried *spirally upon itself*, then it

[1] Fewkes, V. J., "Methods of Pottery Manufacture." AMERICAN ANTIQUITY, Vol. 6, No. 2, 1940, pp. 172 ff. [2] *Ibid.*, p. 172.

[3] Rogers, M. J., "Yuman Pottery Making." *San Diego Museum Papers*, Vol. 2, 1936.

[4] Cf. Fewkes, *op. cit.*, p. 172.

[5] The tectonic components are not coils in the true sense of the word.

[6] Spier, L., "Havasupai Ethnography." *Anthropological Papers of the American Museum of Natural History*, Vol. 29, No. 3, pp. 81 ff., 1928, p. 139.

would be proper to designate the procedure as coiling. However, Spier's text does not permit the reader to discern the actual tectonic principle involved in the construction above the basal portion. Yet it may be *assumed* that either an annual variant or true coiling was observed among the Havasupai by Spier; however, no assumption can claim recognition or satisfy the needs of a technologic description.

Gifford conceived of two major categories of technique, namely, "coiling without the paddle and anvil," and "coiling with the paddle and anvil."[7] As a case demonstrating "coiling with the use of the paddle and anvil," Gifford described his own observations among the Cocopa.[8] It is significant to stress the fact that he expressly specified the role of the paddle and anvil as a distinctly *wall-thinning* function.[9] Moreover, Gifford reiterated his statement in a later monograph on the Cocopa,[10] in which a stinted account of pottery making is included.

In the Southwest it is commonly alleged that Anasazi pottery was made by "coiling" while Hohokam pottery, in contrast (sic), was made by the "paddle and anvil method." Roberts' initial attempt to dispell this confusion[11] appears to have gone unheeded, perhaps chiefly because of the cursory manner in which it was voiced. Gifford obviously missed his opportunity when, in commenting on the praiseworthy effort of Roberts, he failed to differentiate between "coiling" and the "paddle and anvil method."[12] However, Roberts appropriately reiterated his warning in comparing Anasazi and Hohokam wares:[13]

> The pottery made by the two patterns differed in certain respects. Both groups used the coiling method but the finishing process varied. The Anasazi smoothed the surface of their pots with scrapers and polishing stones; the Hohokam completed theirs by employing a paddle and anvil.

"Coiling," or rather *building with fillets*, as applicable to pottery, connotes a constructional process which, by virtue of logic as well as of physical law, unconditionally requires manual manipulation. The potter's hands simply must be free for the handling, placement, adjustment, and bonding of the fillets. The use of the paddle and anvil leads to deliberate alteration of either a partially or a completely built, fully plastic, embryonic vessel. Such alterations may involve, inter alia: thinning of the wall; compacting of the paste; bonding of the tectonic segments; obliteration of junctions; smoothing of the surface; shaping of the final form. However, no matter what the ultimate effect may be, the paddle and anvil, either in their dual role or independently, cannot, again by virtue of logic and of physical law, be utilized as an aid to the constructional process proper. Yet it is conceivable that bonding and adjustment of fillets might, if desired, be accomplished with the use of a paddle, stick, anvil, etc., although such tasks are most commonly

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[7] Gifford, E. W., *Pottery Making in the Southwest*. University of California Publications in American Archaeology and Ethnology, Vol. 23, No. 8, 1928, pp. 353 ff. [8] *Ibid.*, p. 355.

[9] Incidentally, the description detailing the "adding of concentric coils" in the building of the wall (*op. cit.*) identifies the tectonic method as the circuit variant of annular construction by fillets.

[10] Gifford, E. W., *The Cocopa*. University of California Publications in American Archaeology and Ethnology, Vol. 31, No. 5, 1933 pp. 318 ff.

[11] Roberts, F. H. H., Jr., "A Survey of Southwestern Archaeology." *American Anthropologist*, Vol. 37, No. 1, 1935, p. 20. For a somewhat revised version see Roberts, F. H. H., Jr., "A Survey of Southwestern Archaeology." *Annual Report of the Board of Regents of the Smithsonian Institution, for 1935*, Washington, 1936, pp. 507 ff.

[12] Gifford, E. W., "Pottery Making in the Southwest." *American Anthropologist*, Vol. 37, No. 3, 1935, p. 535. It will be recalled that Gifford in 1928 (*op. cit.*, p. 353) recognized " . . . two methods of making coiled pottery . . . in the Southwest. The principle criterion of method is the use or non-use of a wooden paddle and a stone or pottery anvil in shaping the vessel." The confusion of constructional principles with other manipulations is self-evident; it was simply restated by Gifford in 1935.

[13] Roberts, F. H. H., Jr., "Archaeology in the Southwest." AMERICAN ANTIQUITY, Vol. 3, No. 1, 1937, p. 20.

performed by the hands alone. In any event, the manipulation of the tectonic component, as it enters the building process, indispensably requires that the potter's hands be free. And once the component is incorporated in the growing vessel, its subsequent alteration, no matter how attained, no longer constitutes construction.[14] It is, therefore, a gross methodological error either to compare or to contrast "coiling" with the use of the "paddle and anvil," for the two are functionally different. Moreover, the differences involve fundamental principles of technology and lend themselves to objectively determined identification. Therefore, it is imperative to observe and to detail the pertinent technical phenomena and their criteria in a manner commensurate with their significance.

Perhaps the circumstance that considerable laxity has existed in terminology on pottery construction contributed to the confusion here considered. Nevertheless, it cannot be minimized that authors often have failed to be explicit and fully objective in presenting their data. Insistence upon a conscious application of the principles of scientific method cannot be overemphasized.[15]

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BLACK MESA BLACK ON WHITE

A very important southwestern pottery type, well dated by tree ring studies, is called Deadmans Black-on-white by Colton, and Black Mesa Pueblo II Black-on-white by Morss. When the *Handbook of Northern Arizona Pottery Wares* (Colton and Hargrave, 1937) was being written, and there were two descriptions of the type, the question arose which name to choose. The original description of Deadmans Black-on-white appeared in Bulletin 104 of the Bureau of American Ethnology, which carried a printed authorization date of Feb. 17, 1931, and which appeared in 1932. Morss published his description of the same type in 1931, calling it Black Mesa Pueblo II Black-on-white (Papers of the Peabody Museum of American Archaeology and Ethnology). As Morss' name included the unnecessary words "Pueblo II", and so did not fulfill completely the requirements of the rules of nomenclature (a geographic name followed by a descriptive term), as his paper gave no authorization date, and as the name "Deadmans Black-on-white" had appeared more frequently in the literature, the authors of the *Handbook* selected the name Deadmans Black-on-white. However, the decision to use the name Deadmans Black-on-white was based on factors open to discussion. The conditions surrounding the name and the date of publication are, therefore, subject to review.

Gladwin long ago accepted the term Black-Mesa Black-on-white for Gila Pueblo publications (see *Snaketown*) and the type appears under that name in Paul Martin's recent *Anasazi Pottery*. Black Mesa is a good geographical term as it represents the center of distribution of this Anasazi type, whereas the name Deadmans is derived from Deadmans Flat, Coconino County, Arizona, which recent studies show to be just outside Anasazi territory. Besides, the name violates a newly proposed rule of nomenclature (see Museum of Northern Arizona, Bulletin 19, p. 25), which reads: "The same geographic term should not be given to two types unless they belong to the same culture and ware." As five types in three different cultures (branches) and three different wares carry the

[14] Shepard, A. O., "Technology of Pecos Pottery." In *Pottery of Pecos, II*, Papers of the Phillips Academy Southwestern Expedition, Vol. 7, New Haven, 1936. p. 553, fn. 1. Also Fewkes, V. J., Review of "Pottery of Pecos, II." *American Journal of Archaeology*, Vol. 42, No. 1, 1938, p. 197.

[15] This communication is a partial result of certain pottery studies under a Grant-in-Aid of Research from the Society of the Sigma Xi, University of Pennsylvania Chapter, which is hereby gratefully acknowledged.

name Deadmans, and as the application of the rules of nomenclature and priority to this type are open to question, we recommend that the name Black Mesa Black-on-white be accepted as the correct name, making Deadmans Black-on-white a synonym.

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"SALT PANS" AT THE KINCAID SITE

In Vol. VI, No. 1, of AMERICAN ANTIQUITY is a communication by Charles Fairbanks discussing the occurrence of the "salt pan" type of vessel in his early Middle Mississippi horizon (Macon Plateau) at the Ocmulgee National Monument. These specimens show some variety of manufacture and surface treatment, namely, coiling, fabric marking, leaf marking, and complicated stamping. Fairbanks contrasts this variety of handling with the relatively consistent fabric marking and distinct "clubbed" lip in the salt pans of southern Illinois, Kentucky, and Tennessee, where the type seems to have met a definite functional need, i.e. the evaporation of salt at salt springs. Fairbanks accordingly postulates: "The variation of decoration and possibly construction in peripheral areas suggests an acculturation process in which the basic form was retained but the function may have been lost."[1]

In the course of a preliminary analysis of ceramics from the Kincaid Site, I was able to inspect 346 salt pan rimsherds, representing a small fraction of the total available from the site collections, and representing certain typical areas of village refuse. All these were of the same vessel form: large, wide, shallow bowls. Within the series, the following variability was noted:[2]

Fabric marked sherds	140	Incised bevelled lip	2
Plain surfaced sherds	202	Red slipped interior	1
Leaf marked sherds	4	Thickened lip rim	118
Notched exterior edge of lip	1	Rounded and flattened lips; plain rims	84

While this count must not be regarded as final, since the sampling is small and the selection includes rimsherds only, I believe it does indicate that more variation occurs within the salt pan form in its own supposedly central area than is usually assumed. Kincaid may be considered as typical of the Tennessee-Cumberland sites centering in the lower Ohio valley, and as such can be included in the region mentioned by Fairbanks as being the homeland of the salt pan complex.

Salt pan sherds constitute, next to the wide-mouthed jars, the most abundant utilitarian form in the entire Kincaid ceramic complex. This abundance may indicate that the form was used for other purposes than evaporation of salt. The mere fact that salt springs show large quantities of the form is no positive argument for this function being universal. A wide, shallow bowl is a form that would surely have a considerable variety of function; the evaporation of salt can be regarded as only one of these, one that happened to take advantage of a convenient physiographic condition. From this point of view the salt pan merges into a regional specialization of a common and fundamental Middle Mississippi vessel form: the large utilitarian bowl. Also, from this point of view it would follow that the Macon Plateau type of salt pan is no more "peripheral" than that from Kincaid, or the Tennessee-Cumberland types in general.

This may not necessarily controvert Fairbanks' statement, but I believe he overstates the case when he assumes that the fabric marked variety is dominant and exclusive in the Tennessee-Cumberland-Ohio area. Variations occur in this area that are of the

[1] Fairbanks, p. 67.

[2] Rim and lip features listed here are only a sample of the total variations; thus their total is smaller than the 346 specimens listed for surface treatment.

same order as those in his Macon Plateau complex. Moreover, he is comparing an admittedly early horizon with a generally accepted late period.

Although I have not quantitatively investigated the occurrence of form variation in other sites, my personal impression after having observed collections from Kentucky and Tennessee is that a similar regional specialization and variation occurs, of which the net impressed, thickened rim type is only one.

Regarding the theory sketched in by Webb[3] and others concerning the manufacture of such forms by molding in a net lined pit, the Kincaid site has furnished some corroborative data. Near one of the large house complexes were found two rough unfired-clay-lined holes, the size and shape of "salt pans." Near the holes were crude balls of dried clay, and a large cache of broken clamshells. Small postholes suggested a temporary shelter or structure covering the area. Harrington[4] has interpreted this assemblage as a pottery making area.

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FABRIC IMPRESSIONS OF POTTERY FROM THE ELIZABETH HERRELL SITE, MISSOURI

A large quantity of fabric impressed pottery was found during the excavation of the Elizabeth Herrell Site in Jefferson County, Missouri, by the Academy of Science of St. Louis.[1]

Inasmuch as variations in weaving technique have proven of value in distinguishing and in indicating the connection between ethnic groups[2] this study has been made in an effort to aid archaeologists in comparing the finds at the Herrell Site with the results of other expeditions.

The Herrell Site is a village site which belongs to the Middle Mississippi phase of the Mississippi pattern. The reasons for designating this site "Middle Mississippi" and a full description of the site are given elsewhere.[3]

In the course of excavation only two types of textile imprinted pottery were found; cord imprinted and fabric imprinted. Since this study concerns only the fabrics, we may dismiss the cord imprinted pottery. Of over 50,000 sherds from the site approximately 19% are fabric impressed.

The fabric impressed pottery was all shell tempered. In hardness it varies from 2 to 3. The sherds vary from medium to thick with the average thickness being about one centimeter. The color varies from brown to gray and occasionally the surface has a red slip. While ten pot shapes have been found, the fabric impressions, in so far as we have been

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[3] Webb and Funkhouser, *The Tolu Site*. University of Kentucky Publications in Anthropology and Archaeology, Vol. I, No. 5, 1931, pp. 375–380.

[4] Harrington, J. C., "The Metropolis Expedition of 1934." MS., University of Chicago, 1935.

[1] This material was investigated by a Work Projects Administration Archaeological Survey sponsored by the Academy of Science of St. Louis and co-sponsored by the State Museum at Jefferson City. Dr. Thorne Deuel of the Illinois State Museum is the consultant. We wish to express our gratitude to Mrs. Herrell for permission to investigate this site, and to H. H. Ellis for helpful suggestions and the use of the Ohio State Museum library.

[2] Miner, Horace, "The Importance of Textiles in the Archaeology of the Eastern United States," AMERICAN ANTIQUITY, Vol. 3, 1936.

[3] The results of the first year of investigation have been published as a Transaction of the Academy of Science of St. Louis, Vol. 30, No. 5, 1941, and include results of the investigations at this site. There is no evidence of historic contacts. D. I. Bushnell, Jr., excavated test pits at the site and reported on his discoveries in *Archaeological Investigations in Ste. Genevieve County, Missouri*, Proceedings of the United States National Museum, Vol. 46.

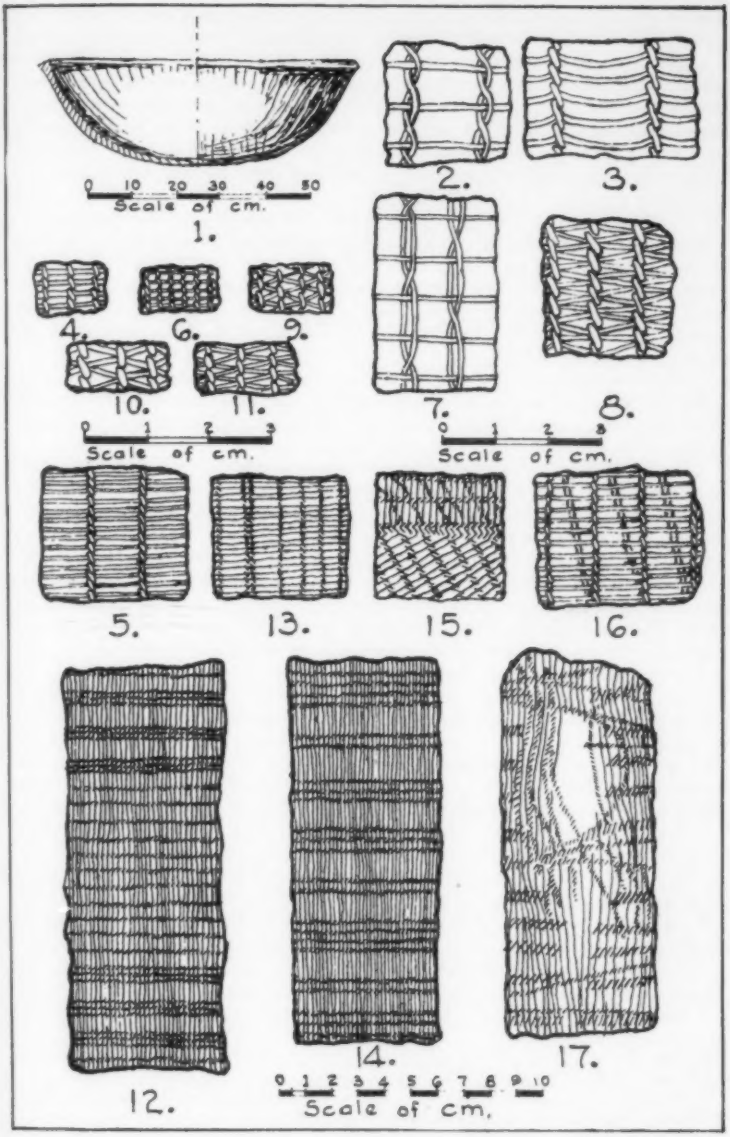

FIG. 19.—Pottery impressions, Elizabeth Herrell Site, Missouri. See text.

able to ascertain, occur only on the large bowls, averaging approximately twenty-eight inches in diameter and ten inches deep (Fig. 19, 1).

Since the only evidence of textiles in this village site is from the impressions on the pottery, it is difficult to tell the material from which the textiles were made. In general, the material used was probably the same as that used by the early historic tribes which inhabited the Eastern half of the United States. Willoughby states that the fiber obtained from the stalks of various plants such as Indian hemp, nettle, and the inner bark of such trees as the linden, slippery elm, and others was used in the manufacture of fabric.[4]

It was possible to study the form of the original fabric by making plaster casts of the fabric imprints.[5] In making casts we found that plaster was the most economical and most durable material to use. A clay wall was built around each of the sherds and they were then painted with soapy water. After the soapy water had been applied, wet plaster was poured on the sherd and allowed to dry. We found that soapy water facilitated the separation of the sherd from the plaster and prevented bits of plaster sticking to the sherd. The plaster casts from the negative imprints on the sherds represent positive duplicates of the original fabrics.

There was only one general type of weave, that which Dr. Miner calls twining.[6] Using Dr. Miner's terminology, we have separated the fabrics into those that are plain twined and those that are twill twined. Plain twined fabric impressions occur more frequently at the site than twill twined fabric impressions.

Dr. Miner describes plain twining as twining in which the woof strands are woven on to the warp in pairs. The woof strands make half turns on each other between each of the warp cords and hence the individual woof strands pass alternately over and under the individual warp cords (Fig. 19, 2 and 3).

Although all the examples of plain twining are similar, there are several interesting variations from the norm. The variations occur in the diameters of the woof and warp cords and in the distances between the woofs and warps, making for a tight or loose weave. There are interesting variations in the number of strands making up the warp and woof cords but there is never any variation in the direction of the twist of the cords; all of the cords seem to have been twisted in a counter-clockwise direction.[7]

Much of the plain twined fabric, as evidenced by the imprints on the pottery, was so loosely woven that it resembles "nets." In general, the woof cords are double, while the warp cords are single. Two cords wrapped around the warp cord make up the woof while only one cord makes up the warp (Fig. 19, 2 and 3). The diameters of the warp cords vary from less than 1 mm. to 1.5 mm. and the distances between the warp strands vary from 0.5 mm. to 3 mm. From this it is apparent that the distance between the woofs is much greater than the distance between the warps. Typical examples of this are shown in Fig. 19, 4 and 5. Fig. 19, 6 is an exceptional example of tight or close weaving.

There is very little variation between the diameters of the woofs and the diameters of the warps. Diameters of the woofs show more variation than do those of the warps. Variations in the appearance of the fabric are due mainly to the spacing of the woof and warp cords.

Dr. Miner characterizes twilled twining by saying that the woof strands pass over and under more than one warp between twists of successive pairs of woof strands.[8] Of all the twill twining represented at the Elizabeth Herrell Site none varies from what Webb

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[4] Willoughby, C. C., "Textile Fabrics from the Burial Mounds of the Great Earthwork Builders of Ohio." *Ohio State Archaeological and Historical Quarterly*, No. 4, 1938.

[5] This technique was used by Holmes, W. H. See *Annual Report, Bureau American Ethnology*, 1881–82, pp. 397–425. Holmes used clay for his casts, whereas we used plaster.

[6] Miner, *op. cit.* [7] Miner's (*op. cit.*) terminology. [8] Miner, *op. cit.*

calls zig-zag twilled twining.[9] Miner describes this as the pulling from side to side of the warp strands as they are included in different pairs by the successive woofs (Fig. 19, 7 and 9).

TABLE I.—REPRESENTATIVE PLAIN TWINED WEAVE MEASUREMENTS*

Sherd	*Diameter of Woof*	*Distance between Woofs*	*Diameter of Warp*	*Distance between Warps*
1	2.5 mm.	6.0 mm.	1.5 mm.	1.0 mm.
2	1.33	3.0	1.5	0.5
3	2.0	16.0	1.5	2.0
4	2.0	13.0	1.0	2.0
5	1.5	5.0	1.5	1.0
6	2.0	4.0	1.5	1.0
7	2.0	13.0	1.5	2.5
8	2.0	17.0	1.5	2.5
9	2.0	15.5	1.5	2.5
10	2.0	16.5	1.5	2.0
11	1.5	4.0	1.25	0.75
12	1.75	4.0	1.25	0.75
13	1.50	13.0	1.25	1.5
14	1.0	1.0	0.75	0.5
15	2.25	20.0	1.50	3.0
16	1.0	3.0	1.0	0.75

REPRESENTATIVE ZIG-ZAG TWILL TWINED WEAVE MEASUREMENTS*

Sherd	*Diameter of Woof*	*Distance between Woofs*	*Diameter of Warp*	*Distance between Warps at Widest Point*
17	1.0 mm.	4.0 mm.	0.75 mm.	0.5 mm.
18	1.25	2.0	0.50	0.75
19	1.5	3.0	1.0	0.75
20	1.0	2.50	1.25	0.75
21	1.0	1.25	0.5	0.5
22	1.25	2.0	0.75	0.75
23	0.75	3.50	0.5	1.0
24	2.0	3.0	1.0	1.0
25	2.0	3.0	1.0	1.0
26	1.50	3.50	0.75	0.75
27	0.75	0.75	0.5	0.25
28	1.0	1.5	0.5	0.25
29	1.0	1.75	0.75	0.75
30	1.0	4.5	0.5	0.5

* The selection of the sherds for these measurements was influenced by the opinions of the authors as to which were the most perfect specimens and which the most representative.

Ordinarily the weave of the zig-zag twill twined fabric is much finer than the weave of the plain twined fabric. Not only are the warps and woofs of the zig-zag twill twined fabric much more closely woven but the diameters of the two are smaller, on an average, than the plain twined. The diameters of the woofs of the zig-zag twill twined fabric vary from less than 1.0 mm. to 1.5 mm. The greatest distance between the woof strands is 4.5 mm. and the least distance between the woof strands is less than 1.0 mm. The diameters of the warp strands are very small, varying from 0.5 mm. to 1.25 mm. The dis-

[9] Webb, W. S., *The So-called "Ash Caves."* Reports in Archaeology and Anthropology, University of Kentucky, 1929.

tance between the warp strands at the point where there is most separation (i.e., where one warp has been pulled in an opposite direction from another warp) varies from 0.25 mm. to 0.75 mm. While there is not much variation between the diameters of the woofs and warps, the factor which makes variations in the appearance of the fabric is the closeness with which it has been woven. Fig. 19, 9 is an example of a closely woven zig-zag twill twined fabric and Fig. 19, 10 is an example of loosely woven zig-zag twill twined fabric. Fig. 19, 11 is given as an example of a rather fine weave in which the woof cords have been separated by a much greater distance than the warp cords.

There are several interesting deviations from the ordinary plain twined and zig-zag twill twined fabrics described above. An interesting modification of the plain twined fabric found at the Elizabeth Herrell Site is illustrated in Fig. 19, 12. Note that in this fabric there are three series[10] of woofs at the top, each separated from the other by about 8 mm. and that under these are eleven single woofs. Under the eleven single woofs are three more series of three woofs almost identical with those at the top. Another interesting deviation from the plain twined type of weaving is shown in Fig. 19, 13. In this fabric two types of woof combinations may be noticed. At the left of the figure are imprints of two woofs side by side. Separated from this series of woofs by 1 cm. another series of woofs starts. The later series are not close together but separated from each other by about 6 mm.

An interesting modification of the zig-zag twill twined type of fabric is illustrated in Fig. 19, 14. There is one series of four woofs, each woof composed of two strands twining around the warp cords. Under this are seven more series of woofs. The number of woofs in each series are, in order, four, two, three, three, two, four, two and three. The warp strands maintain their zig-zag appearance between the woofs which are close together and which form the various series. There are three possibilities to explain why the series of woofs were placed together: (1) an attempt to make the fabric stronger, (2) an attempt to produce a design, and (3) a combination of (1) and (2). It is difficult to see how the series variation in Fig. 19, 14 would strengthen the fabric, therefore it would seem that an attempt was made to produce a design.[11]

From the appearance of some of the fabric impressions on the rim sherds it would seem that only one square or rectangular piece of fabric was ordinarily used on a pot and that the loose ends of the fabric were usually stretched out away from the pot so that they would not be seen on the finished pot. However, on several sherds two impressions of fabrics were found indicating that the fabric used in the manufacture[12] or decoration[13] of the pot had been folded back (Fig. 19, 15). On such a sherd we have often found the imprint of the border or edge of the piece of fabric. In the fabric shown in Fig. 19, 15 is a woof border which has been reinforced by two extra woof cords.

Another interesting dual set of fabric marks is illustrated in Fig. 19, 16. The fabric which was placed next to the clay of the pot when it was still soft has the single woof, whereas the fabric placed next to the first fabric (the dimmest in the figure) was composed of pairs of woofs.

Sherds have been found on which the imprinted fabric had been torn and patched: in Fig. 19, 17 the weave is zig-zag twill twined, and several individual cords hold the fabric together where it had separated.

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[10] By "series" we mean one or more woofs in close proximity to another woof.

[11] An examination of Fig. 19, 1 shows a rhythm of series spacings of 4, 2, 3, 3, 2–4, 2, 3 ? but this is only a possibility as we have only one large sherd showing this series rhythm.

[12] Dellenbaugh, F. S., "Fabric Marked Pottery," *Appleton's Popular Science Monthly*, March, 1898, believes that fabric was used in manufacturing pottery.

[13] Holmes, *op. cit.*, believes that fabric was used on pottery as a decorative device.

The analysis of the fabrics imprinted on the sherds found at the Elizabeth Herrell Site shows that only one basic type of weave, twining, is present. This has been divided into sub-types, zig-zag twill twined and plain twined. While there are many differences in the diameters of the woofs and the warps and in the closeness of the weaves, the most outstanding deviations are in the evidences of decoration and/or strengthening of the fabric.

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SOME TEXTILE SPECIMENS FROM THE ALEUTIAN ISLANDS

The twelve specimens[1] here analysed were obtained from the island of Kagamil in the Four Mountain Group and from the island of Shiprock in Umnak Pass. No date other than merely "pre-Russian" has been assigned either burial cave from whence the specimens were obtained, although it is likely that Dr. Aleš Hrdlička will formulate a satisfactory chronology for the known sites of the Aleutian Islands. The specimens consist of the fragments of five baskets or mats, five cords, and two bird skins, the latter presumably from parkas. While these specimens are few in number and in no wise unique, the paucity of published material on the prehistoric textiles of the Aleutian Islands justifies this paper.

Basketry. Dr. A. C. Whitford of Alfred University, to whom the series was sent for botanical analysis, found the majority of the specimens were of wild rye (*Elymus mollis*), while the dark fiber constituting the decoration on specimens A-1, D-1, and D-2 seems to have been obtained from a plant similar to *Scirpus*.[2] Mason[3] and Dall[4] mention wild rye, while Jochelson[5] lists wild barley (*Elymus mollis* Trin.) and wild pea (*Lathyrus maritimus*) among the grasses commonly used in modern Aleutian basket weaving. The description of the gathering and preparation of the grasses by modern Aleuts, as given by Jochelson, probably parallels the prehistoric methods. The grass was stored in dry caves for use during winter months, the blades were split with the finger nails, and by varying the degrees of drying, tints from dark green to light yellow were obtained. This accounts for the coloration of the fibers in the specimens under analysis although one cannot ascertain whether or not some of the dark fibers used in decoration were dyed.

The techniques used in this series and the general appearance of the fragments indicate that the weaving methods and material are practically identical with those described in the literature on modern Attu basketry. Mason pictures[6] an Attu basket weaver working with the warps suspended by a rope; and Weltfish,[7] in comparing modern Tlinkit and

[1] Although several fragments come from one and the same textile, each fragments is treated as a separate specimen. The technical analysis was done by Mrs. Kate Peck Kent as Research Associate in Ethnology of the Denver Art Museum whose acting director, Mr. Eric Douglas, kindly contributed much additional information.

[2] For anyone especially interested in textile technology, photomicrographs of the following are available: (1) *Elymus mollis* of specimens A-1 and D-2; (2) undetermined black fiber of specimen A-1; and (3) *Scirpus microcarpa* of specimen A-2.

[3] Mason, O. T., "Aboriginal American Basketry." United States National Museum, *Annual Report* for 1902.

[4] Dall, W. H., "Cave Relics of the Aleutian Islands." *Smithsonian Contributions to Knowledge*, Vol. 22, No. 318, 1878.

[5] Jochelson, W., *History, Ethnology, and Anthropology of the Aleut*. Carnegie Institution of Washington, 1933. [6] Mason, *op. cit.*, Pl. 136.

[7] Weltfish, G., "Prehistoric North American Basketry Techniques and Modern Distribution." *American Anthropologist*, Vol. 32, No. 3, 1930, pp. 454–475.

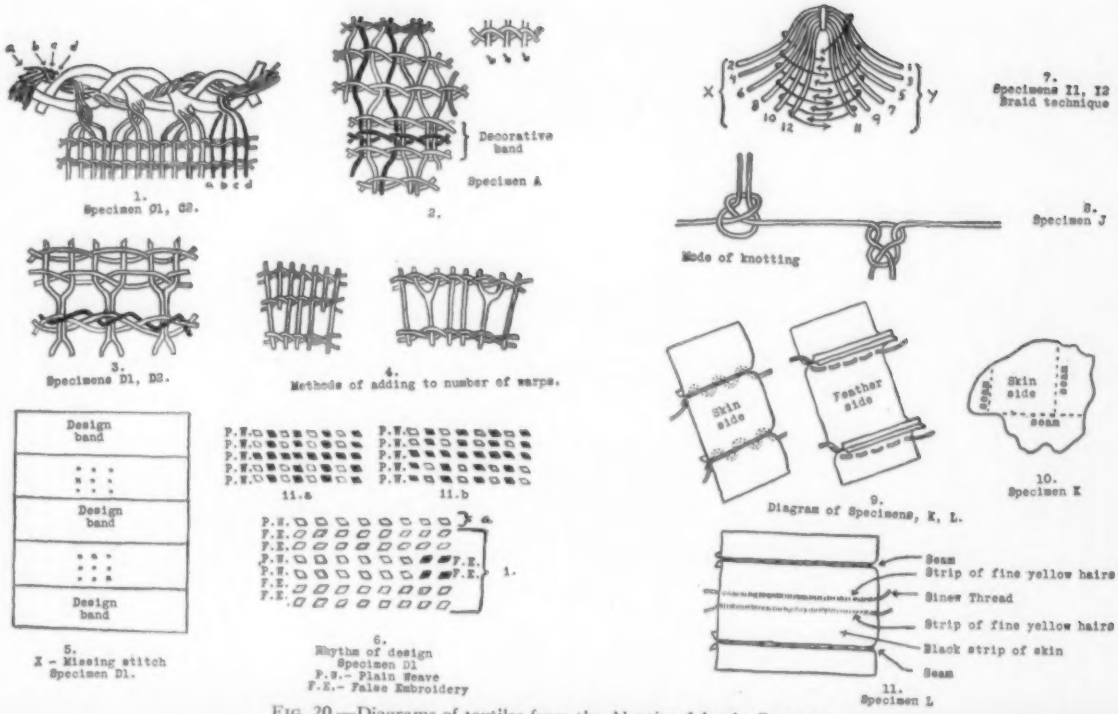

FIG. 20.—Diagrams of textiles from the Aleutian Islands. See text.

Aleut basketry, notes that Tlinkit baskets have stiff warps, and that the weaver weaves with the mouth of the basket up, whereas Aleut baskets have soft warps suspended so that the mouth of the basket is down. In Aleut basketry the weave goes towards the right, forming a clockwise spiral when the basket is upright. This generalization holds true in this series except for Specimen B wherein the stitches slant downwards to the left. All of the specimens were made with the twining technique, either plain or diagonal (often called "twill"), and twilled specimens A-1 and A-2 may be classified as openwork.

Decoration on specimens A-1 and A-2 consists of horizontal bands of three rows of plain twine. The warps run parallel, and two warps are used as one unit. The middle weft row is black (Fig. 20, 2).

Decoration on specimen D-1 consists of horizontal bands of forty-one rows of plain twine, and, as described, the warps run parallel and two warps are used as one unit. These bands include the use of false embroidery,[8] done with shiny yellowish grass; and checkerwork, done by alternating black grass with the natural colored weaving material. Specimen D-2 is the border of D-1 and exhibits the same features.

Specimens B, C-1, E-1, E-2, and E-3 employ the plain twine openwork technique, the grass fibers being much coarser than those in the more elaborate twilled pieces. None of these plain twine specimens are decorated, but C-1 has a heavy braid border (Fig. 20, 1).

Cord. Of the five cords, two are made with wild rye fiber and the other three appear to be of sinew. The regular three-strand braid is employed in the manufacture of four specimens (F, G, H, and J), but specimen I is a square cord braided from twelve sinew strands.

Bird Skins. The two fragments of bird skins, Specimens K and L, are probably bits of parkas. On the skin side of L are two parallel decorative bands of fine yellowish hairs (Fig. 20, 11). Since this decoration is on the skin side, the parka was probably worn feather side in. The fine hairs may be those Dall describes as issuing from between the hoofs of reindeer, and highly prized by the Eskimo.

TECHNICAL ANALYSIS

Specimens A-1 and A-2 are evidently fragments of a single basket.

Maximum dimensions: A-1 has a horizontal measurement of 28 cm. and a vertical measurement of 13 cm. A-2 measures 25 cm. horizontally and 17 cm. vertically.
Average number of warps: per cm.—4 pairs (8 units).
Average number of wefts: per cm.—3 rows.
Average interval between rows of wefts: .3 cm.
Material: wild rye, of natural color, constitutes the greater portion of the specimens. The black decorative strands are of an unknown plant fiber. Each weft and warp strand contains about fourteen fibers, and both warp and weft are very soft and flexible.
Description: the specimens are of the diagonal twine, or twill technique with the warps zigzagging the length of each piece, except in the bands of decoration where the warps are parallel. Decoration is produced by horizontal bands placed 2.9 cm. apart, specimen A-1 having three such bands and A-2 two. The bands are composed of three weft rows of plain twine with the warps running parallel and pairs of warps treated as single units. The rows are compressed, and the central row in A-1 is black. Each band is .6 cm. in width.

Specimen B is a fragment of a basket.

Maximum dimensions: the horizontal measurement is 20.4 cm., the vertical measurement is 52.8 cm.
Average width of one weft strand: .2 cm.
Average interval between weft rows: .5 cm.
Average width of one warp strand: .25 cm.
Average number of warps: per cm.—3½.
Average number of wefts: per cm.—2.

[8] *Leaflet 68*, Denver Art Museum.

Material: each warp and weft strand is composed of about 10 fibers of wild rye. No dye or coloring is used.
Description: it is made with plain twine open-work technique with the warps parallel. There is no decoration.

Specimens C-1 and C-2 are evidently fragments of a single basket.

Maximum dimensions: C-1 has a horizontal measurement of 23.5 cm. and a vertical measurement of 14.5 cm. C-2 has a horizontal measurement of 10 cm. and a vertical measurement of 12 cm.
Average width of border of C-1: 3 cm.
Average width of border elements of C-1: 1.3 cm.
Average interval between border and plain weave of C-1: 2.7 cm.
Average width of weft strand: .3 cm.
Average distance between wefts: 1.4 cm.
Average width of warp strand: .4 cm.
Average number of wefts: per cm.—1.
Average number of warps: per cm.—2.
Material: wild rye. Each warp and weft strand is rather broad and flat, with six to ten fibers in each strand. No dye is used.
Description: the technique is plain twine open-work with the warps running parallel. There is no decoration. The border of C-1 is a heavy braid, and shows the method of finishing off the warps after the piece was woven. Four warp strands are twisted together and braided into a border which doubtless constituted the basket rim.

Specimen D-1 and D-2 are evidently fragments of the same basket.

Maximum dimensions: D-1 measures 21 cm. horizontally and 35.3 cm. vertically.
Average number of warps: per cm.—4 pairs (8 units).
Average number of wefts: per cm.—6.
Material: the body is of wild rye. The black decorative strands are of an unknown plant fiber. There are about 7 fibers per warp or weft strand. The piece is natural in color throughout with the exception of the black strands which appear to have been dyed in some manner. The stitching of the false embroidery is of smooth shiny grass not as yellow as the regular weave and hence probably the outer coat of the rye.
Description: this is of diagonal twine, or twill technique. There are three horizontal bands of decoration on this piece spaced 5 cm. apart. In the spaces between these bands are series of dots, each made by two stitches of false embroidery, arranged as shown in the diagram (Fig. 20, 5). Vertically, the dots are 1.4 cm. apart on the average. Horizontally, the dots are 3 cm. apart on the average. The decorative bands are produced by false embroidery and by the use of black strands in addition to those of natural color producing a checkered effect. The false embroidery makes a raised pattern. There are forty-one rows per band and the design rhythm in these bands is to be seen in the diagram on Fig. 20, 6. The design rhythm of the three decorated bands is:

Top band (top down):	a-i-iib-i-iia-i-iia-i-a
Center band (top down):	a-i-iib-i-iia-i-iib-i-a
Bottom band (top down):	a-i-iia-i-iia-i-iib-i-a

Specimen D-2 is evidently the border of D-1.

Maximum dimensions: the horizontal measurement is 54 cm., the vertical measurement is 21 cm.
Average number of warps and wefts: as in D-1 above.
Material: as in D-1 above.
Description: the border consists of three rows of false embroidery alternating with three rows of regular weave of checkered black and natural tan. Considering the false embroidery rows as number 1 and the regular weave rows as number 2, the design rhythm from border edge to border edge is: 1-2-1-2-1-2-1-2-1

Specimens E-1, E-2, and E-3 are evidently fragments of the same basket.

Maximum dimensions: E-1 has a horizontal measurement of 13 cm. and a vertical measurement of 9 cm. E-2 has a horizontal measurement of 8.5 cm. and a vertical measurement of 11 cm. E-3, the bottom section of the basket, has a horizontal measurement of 6.5 cm. and a vertical one of 4.5 cm.
The following measurements are the same for all of the pieces, with irregularities for E-3.
Average width of warp and weft strands: .3 cm.
Average number of warps: per cm.—2 plus.
Average number of wefts: per cm.—2.
Average distance between warps: 1.5 cm.
Average distance between wefts: 4 cm.
Material: wild rye. No dye is used.

Description: the specimens are woven in plain twine open-work technique. The bottom piece, E-3, is too fragile to allow analysis as to how the weave was started. Two methods were used to add to the number of warps in order to increase the size of the basket: (a) merely adding additional warps when desired; and (b) bifurcating the original warps when desired. Both methods are shown in Fig. 20, 4.

Of the cord specimens, F, G-1, G-2, H, I-1, I-2, and J, only I-1 and I-2 (evidently bits of the same cord), and J, are worthy of special attention, the other specimens being ordinary three-strand braid, and of wild rye fiber or sinew.

Specimens I-1 and I-2 are presumably bits of the same square cord.

Dimensions: I-1 is 17.5 cm. in length, and I-2 is 23 cm. in length. In both I-1 and I-2 the width of each side of the square cord is .5 cm., while the width of each braid element is .15 cm.

Material: they are of sinew.

Description: the specimens are from one square cord braided from twelve strands as shown in (Fig. 20, 7). "For braiding, the twelve strands are fastened securely together at a fixed point so that they can be kept at even tension. The strands are then separated into two groups of six strands each, X and Y. These groups of strands are held flat, not bunched together, and always in the same relative positions. The braiding movement is always from the outside of one group to the inside of the other, the sides alternating. To begin the braid, the outer strand of Y, No. 1, is carried in front of that group to the inner edge of group X. Then the outer strand of group X, No. 2, is carried behind that group to the inner edge of group Y."[9] The following chart gives the strand movements for the first twelve movements. "Front" means that the outer cord is carried in front of its group, and "Back" means that it is carried behind its group:

Group X	*Group Y*
	Front 1
Back 2	
	Back 3
Front 4	
	Front 5
Back 6	
	Back 7
Front 8	
	Front 9
Back 10	
	Back 11
Front 12	

After these twelve movements the strands in group X have changed places with those in group Y. The sequence of movements is continued, with the difference that strands 1, 3, 5, 7, 9, and 11, are now on the left side or X side, and the completion of a second set of twelve movements returns the strands to their original sides. This alternation is continued until the cord is completed.

Specimen J is a cord.

Dimensions: the specimen consists of a long cord, broken into seven fragments, measuring 210 cm. in length Along this cord at intervals of approximately 15 cm. were knotted short cords, six in all, with an average length of 7.6 cm. However, these short cords were doubled in the knotting process as shown in Fig. 20, 8.

Material: this is made of wild rye.

Description: this is a three-strand braid. The attachment of the short cords may be seen in Fig. 20, 8. The short cords were attached alternately first on one side and then on the other of the main cord. This may have been a fishing line to which numerous hooks were added, or it may have been a portion of a net with the meshes subsequently broken.

Specimen K is bird skin.

Maximum dimensions: 17.8 cm. by 19 cm.

Material: it is the skin of a bird of undetermined species.

Description: the specimen has been pieced together with an ordinary running stitch. Each stitch measures from .2 cm. to .3 cm. in length. The amount of skin turned in for the seam is extremely small. The seams are invisible on the feather side of the skin (Fig. 20, 10). Specimens K and L were sewn as shown in the diagram (Fig. 20, 9).

[9] *Material Culture Note*, Denver Art Museum, No. 5, p. 20.

Specimen L is also bird skin.

Maximum dimensions: 15.8 cm. by 14.5 cm.

Material: it is the skin of a bird of undetermined species. A strip of darker skin is sewn into the seam. On this dark strip of skin are sewn yellow stripes of fine hairs attached to small strips of hide.

Description: the skin is decorated by a strip of dark skin sewed to it about 3.2 cm. to 4.3 cm. from the nearest edge. This dark strip is 1.3 cm. in width and 14.5 cm. in length. The strip does not show on the feather side since the feathers are about 4.5 cm. long. This dark strip is sewed with a running stitch and seams as in Specimen K. Down the center of this dark strip are sewn two narrow yellow bands each .2 cm. wide, consisting of fine hairs, clipped short, attached to strips of hide which are in turn sewed to the dark strip with an ordinary running stitch (Fig. 20, 11).

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A CAVE HABITATION IN VERMONT

This brief description of the site and evidence of occupation is written for the purpose of preserving the data. Considering the rare reference to cave habitations in reports of Eastern activities, this bit of evidence seems worth recording.

Approximately one mile below Carvers Falls, in the valley of the Poultney River, and nine miles from Lake Champlain, the cave entrance is seen as a crevice, open overhead, in an outjutting part of the southern face of a limestone cliff. The opening is near the top of the cliff and at the summit of a talus incline extending into a land-locked pool where once the river was navigable by large boats before historical freshets changed the scene.

The upright walls of the entrance, five feet apart, converge for a distance of seven feet to the cave doorway, three feet wide by five feet high. The interior space is small, ten men might stand under its dome shaped ceiling and as many more be accommodated on hands and knees. The subsoil is gravel whereas the soil of neighboring terrain is the typical sand and clay of the Champlain Valley.

There appears to have been two occupations, the entrance space first, later the interior after some excavating. A cross section sketch of the record of excavation shows a level stratum two feet below the entrance surface, evidently the floor of the first occupation. Here artifacts of bone and antler together with teeth and broken bone of contemporary animals collected under foot, extending from the talus shoulder to the slanting base rock under the doorway. There was scant evidence of flint in this strata which was eventually covered by soil dug from the cave floor to provide more head room.

The later occupation left numerous projectile points, all of which were found near the surface scattered from the interior to the outside shoulder. The arrow points were mostly triangular, a few stemmed; the material ranging from good gray chert to inferior flints and some quartzite. No animal matter appeared in this surface stratum.

Animal life represented in the artifacts and refuse included elk, deer, black bear, red fox, otter, beaver and smaller types.

Of foremost interest in artifacts, and a rare find for this locality, was a tubular shell bead in perfect condition, over an inch long and about the diameter of a pencil, well polished over all and into the end openings. This was in a little cache in an alcove of the interior with a small chert scraper and stemmed arrow point, two triangular quartzite points, a queer heavy triangular point or tool, and a crude little adze-shaped stone piece. In the lower strata, there were several sections of small polished bone tools, a worked

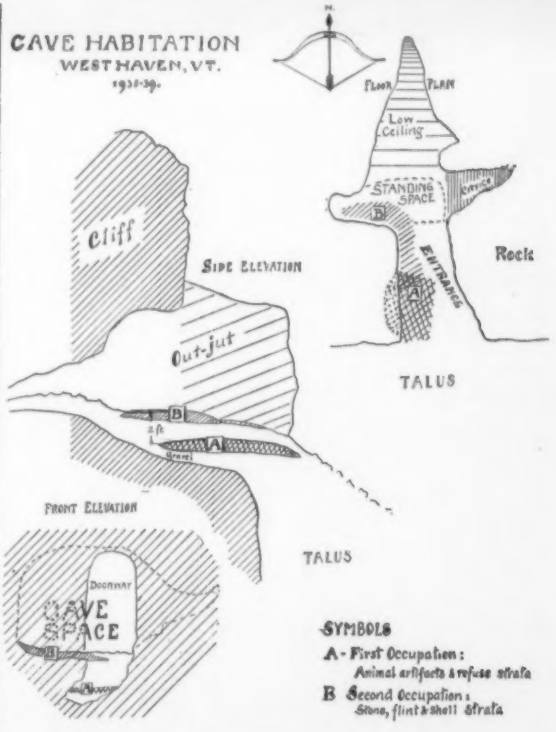

FIG. 21.—Rock Shelter, West Haven, Vt. Scale of artifacts 2/5 natural size; plans and sections, one inch equals ten feet.

discoidal, broken pieces of antler tools and one perfectly sound slender awl made from a curved splinter of antler. All animal material had been well preserved by the lime content of the soil.

A near-by rock shelter in the same cliff contained, besides a number of triangular arrow points, potsherds of a dark hard material including an interesting section of rim and neck unusually thin and hard as compared to local pottery. It seems to be tempered with a finely ground lustrous mineral grit. The rim is moderately castellated with smoothed square edge, its convex outline drawn gracefully down to a constricted neck carefully smoothed and decorated above the neck with a border of saw-tooth design forming triangular plats filled with incised lines parallel to the lip, very similar to the restored Iroquoian jar found by John Bailey at Vergennes. It is a much better class of pottery than the material typical of the Algonkin people in this territory.

Extensive occupation of nearby cultivated fields is indicated in many artifacts which have been found on the surface, all types of arrow points, heavy adzes, ground slate and flint knives, innumerable scrapers and many hammer stones. In recent digging, fire pits and interesting refuse pits have been recorded as found under the plow level on the plateau along the north side of the river valley.

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NOTES AND NEWS

University Microfilms, Ann Arbor, Michigan, has available a microfilm record of the exhibition of Indian art at the San Francisco World's Fair of 1939. The film includes excellent photographs of specimens that were on exhibition as well as a few shots of installations.

ARCTIC AREA

Dr. Froelich G. Rainey of the University of Alaska is at Point Hope, on the Arctic coast, conducting further excavations at the ancient Ipiutak site discovered in 1939. Accompanying him is Dr. Harry L. Shapiro of the American Museum of Natural History who is to make anthropological studies on the living Eskimos as well as on the skeletal material from Ipiutak.

Mr. J. L. Giddings, Jr. of the University of Alaska is continuing his tree ring investigations, searching for additional material to extend the sequence obtained from timbers at Point Hope, St. Lawrence, King and Diomede Islands. Mr. Giddings has shown that cross dating is possible with Arctic driftwood and has established a tree ring sequence extending back to 1625. With this beginning it is hoped that the older stages of Eskimo culture may eventually be dated (see J. L. Giddings, Jr. "The Application of Tree-Ring Dates to Arctic Sites," *Tree-Ring Bulletin*, October, 1940.)

The University of New Mexico News Service reports that Dr. Frank C. Hibben was to leave for Alaska in May to search for Paleo-Indian remains. The regions to be investigated are Cook Inlet, the Katmai National Monument on the Alaska Peninsula, and the Yukon valley. (*H.B.C.*)

SOUTHEASTERN AREA

The Sixth Southeastern Archaeological Conference was held at the University of Kentucky, Lexington, Kentucky, on the 4th and 5th of September. The several sessions were devoted to separate aspects of the problem.

September 4

Morning; Early Horizons in the Southeast, A. R. Kelley, Chairman. Speakers; Fairbanks, Foster, Greenacre, Carey, Haag, Quimby, Snow, Hulse, and Stirling.

Afternoon; The Hopewellian Phase in the Southeast, George I. Quimby, Jr., Chairman. Speakers; Quimby, Anderson, Wimberly, Tourtelot, Elliott, Black, Deuel, Snow, Neumann, Setzler.

Evening; "The Angel Mounds," Glenn A. Black.

September 5

Morning; Middle Mississippi Pottery Types, James B. Griffin, Chairman. Speakers; Adams, Phillips, Dickinson, Kneberg, Foster, Fairbanks, Wilder, Black, Griffin, Deuel, Bennett, Jennings, Quimby.

Afternoon; Protohistoric Horizons in the Southeast, Jesse D. Jennings, Chairman. Speakers; Miller, Fairbanks, Finklestein, Haag, Griffin, Wilder.

NORTHERN MISSISSIPPI AREA

Dr. Emerson F. Greenman conducting the University of Michigan Museum of Anthropology expedition to Manitoulin Island has transmitted additional information regarding the location of early sites in the Great Lakes area.

"Excavation has been carried on at three sites since July 1, but most of the work has

been done on the upper one at an elevation of 297 feet. This one was first found in the summer of 1940, and in its elevation above lake level and in the artifact typology it appears to be of considerable antiquity. The work done there so far this summer has brought little that is new, but all the conclusions with respect to its contemporaneity with the water of the Great Lakes at that level have been strengthened. In addition, another site of the same culture and at the same, if not a higher, level has been found about a quarter of a mile distant. The existence of these two sites at that elevation would in itself go a long way to show their antiquity without the presence of waterworn stone implements. We hope to find more sites up here in the future. It seems to be a matter of locating broad valleys with openings on to the shore at an Algonquin or post-Algonquin level, particularly where that shore would be at the bottom of a protected bay at that level."

The following report by Dr. Lloyd A. Wilford summarizes the current field results in Minnesota.

"The University of Minnesota field party began its season on June 16 at Lake Shetek in southwestern Minnesota. Two mounds of the Woodland Pattern were excavated and proved to contain multiple secondary burials in a central pit beneath a sterile mound. This type of mound is the same as those previously excavated in the Mankato area and points to the existence of a Southern Minnesota Aspect of the Woodland Pattern. The pottery is definitely Woodland with rather frequent use of incised lines in the decorated area near the rim.

"Two weeks were spent at a village site 8 miles west of Lake Shetek. The pottery of this site has a fine-lined cord-wrapped paddle decoration on the body, while the vertical necks are decorated with closely spaced, parallel, incised lines placed horizontally, crossed at intervals by diagonal lines. The pottery is the most uniform in shape and decoration of any site known in Minnesota. A feature of the village site is the frequency of shallow fire pits and deeper storage pits. Pottery of this type is known to occur at least at three other sites in the southwestern corner of the state. The relationships of the culture represented at the site are not yet determined, but the pottery most resembles the Mill Creek of Iowa.

"Two weeks were spent investigating Woodland village sites at Tuttle Lake and Fox Lake close to the Iowa line in south central Minnesota. Like the pottery of the Lake Shetek mounds, the pottery of these sites is definitely Woodland, with the incised line frequently used in the decorated area near the rim.

"One month was spent investigating the little known Cambria culture whose center in Minnesota is apparently the area between Mankato and New Ulm on the Minnesota River. It apparently belongs to the Mississippi Pattern, with highly developed agriculture, grit-tempered vessels with angular shoulders, paired handles and designs from shoulder to neck in deep trailed lines. The pottery is not Oneota, though sites of the Blue Earth Focus of the Oneota Aspect are found both to the south and to the west. Deep storage pits, triangular arrowheads, and snub-nosed end scrapers are numerous. Classification of this culture awaits further study."

The Ohio State Museum-Ohio State University summer field party excavated a small mound north of Chillicothe. The work was under the direction of Richard G. Morgan and H. Holmes Ellis. It is an Adena structure with an intrusive Fort Ancient burial. The mound was constructed over a central sub-floor log tomb slightly less than thirty feet in diameter. The original surface has leaf and grass impressions. A small cache of flint blades, notched points, scrapers, drills, 2 copper bracelets and pottery were found in the mound fill and on the floor. The sub-floor tomb had not been excavated at the time this summary was transmitted.

Dr. Thorne Deuel sends in the following notice regarding excavations in the St. Louis area.

"The Murdock Mound (Cahokia Mound #55) now being excavated by the Illinois State Museum, Illinois State Parks Division in cooperation with The Works Projects Administration from the work done to date appears to be a mound built as a substructure for houses. It contains apparently a number of structures at different levels indicating that it has been added to from time to time either purposefully or by the accumulation of refuse or both.

"Post-holes and a section of a packed clay floor, partly fired, have been discovered. The artifacts and pottery occurring indicate the Middle Mississippi phase without any patent exception. A few badly disintegrated bundle burials and some isolated human bones have come to light."

Glenn A. Black reports on the recent archaeological work in southwestern Indiana as follows.

"The Indiana Historical Society-Works Projects Administration archaeological investigations of the Angel Site in Vanderburgh County, Indiana, are now in the 28th month of activity. During this time varying numbers of workers have been engaged in exploring parts of the village site, the encircling embankment palisade and the second largest mound of the group. To date approximately 50,000 square feet of village site floor has been explored, plotted and mapped. 600 lineal feet of the palisade has been uncovered and Mound F has been approximately half excavated. Cleaning, cataloguing and classifying of material has gone along apace with the explorations, approximately one and one-quarter million specimens having been so handled.

"Mound F, as was anticipated, consists of two mounds, the primary and secondary. An exploratory technique was used whereby it was possible to strip away completely the secondary mound mantle with the resulting exposure of the primary mound in its entirety. At this writing the destroyed house standing upon the truncate apex of the primary mound is now being uncovered. Particular structural details cannot now be given but, generally, the structure was a large, rectangular house apparently having two or more interior divisions. An unexpected feature was the discovery of a series of post molds indicating the former presence of a stockade completely surrounding the square top of the primary mound. Regular post patterns adjacent to the southeast and northeast corners of the principal house pattern strongly suggest exterior anterooms or porticos."

Robert Schneider has this to say concerning the work of the Aboriginal Research Society of Detroit:

"Members of the Aboriginal Research Society of Detroit were actively engaged in locating village sites in various parts of the state during the past summer.

"Carl Holmquist and Rober Schneider located an outcropping of chert, hitherto unknown, along Otter Creek in Monroe County, where the Indians obtained material for their arrow points. Points found on various sites, show characteristics which make it possible to trace their source to this outcropping.

"A site was located in St. Clair county along Swan Creek which yielded considerable pottery. One sherd found shows a high polish on both surfaces. The rim decorations, are vertical incised lines, stamped patterns and cord wrapped stick. They are all grit tempered with semi-roughened body surfaces.

"A typical Algonquin site was located along the shore at Point St. Ignace on the Straits of Mackinaw. A test excavation yielded much Woodland type pottery and notched arrowpoints, an arrow chipper of hematite was also recovered. This location is recorded in early history to have been occupied by the Chippewa and Ottawa tribes. A report of a

mound in the vicinity was traced. It had been plowed down during the past years. Two copper axes of the mound builder type and copper beads were found with burials by the owner." (*J.B.G.*)

SOUTHWESTERN AREA

A Laboratory of Anthropology-Columbia University field party headed by E. T. Hall, Jr., has been working at Governador, New Mexico during the summer. This area is situated east of the Aztec ruin and directly south of the Piedra River sites.

Three pit houses, varying from six to twelve meters in diameter, were completely excavated. Associated with these were surface structures used as granaries, storage cists, both earthen and slab-lined surface firepits, and a large stockade of posts completely surrounding two pit houses. Trash mounds yielded several burials in fair condition as well as restorable vessels and artifacts.

Pottery is mainly indigenous with few intrusives. Utility wares indicate that the Governador region was a center of basket-molded vessels. Use of scored surfaces is an exception to the pottery of adjacent areas. Decorated ware is apparently ancestral to Mera's somewhat later type, Gallina Black-on-white.

The University of New Mexico field school at Chaco Canyon National Monument, directed by Leslie Spier, Paul Reiter, and William Mulloy, continued work in small sites across the arroyo from Chetro Ketl, including notably completion of excavation of Bc 53, begun last year by F. H. H. Roberts, Jr. The ruin is a small pueblo, which in its short occupation and simplicity presents a happy contrast to most Chaco sites and which will prove an especially useful contribution.

A University of New Mexico expedition also worked in the Gallina country during the summer.

Further excavation at Arrowhead ruin, an interesting 14th century site on Glorieta Pass south of Santa Fe, was carried on during the early summer by the Texas Technological College expedition under Dr. W. C. Holden.

An expedition sponsored by R. E. Allen and Washington and Jefferson College of Pennsylvania worked during the summer at Pueblo Pardo ruins, some three miles south of Gran Quivira National Monument, under the supervision of Custodian J. H. Toulouse, Jr., of Gran Quivira, New Mexico, with the assistance of Robert L. Stephenson.

So far the excavations have been in the latest periods of occupation of the village. Two types of burial have been uncovered, cremations as well as typical inhumations of the Pueblo type. Cremations are found in small pits beneath floors and along the walls, with the ashes, charcoal, and bones from the crematory fires. Funerary offerings are mostly fragmentary pots and sherds. Inhumation appears to be contemporaneous, is tightly flexed form, and the prevalent postiton seems to be with the head to the north and face east. They are subfloor, along the walls. Offerings are similar to cremations. The physical types found range from long-heads through medium to round-heads, and all three types have been found both deformed and undeformed.

The buildings are of the typical cellular Pueblo form built around an open plaza.

Donald J. Lehmer completed his second season's work in the vicinity of Las Cruces, New Mexico, under the sponsorship of the Museum of New Mexico, with W.P.A. labor. Excavations were confined to sites of the (early) Mesilla phase defined during the 1940 season. Circular and rectangular pithouses were found. The rectangular structures were very similar to those which Haury assigned to the San Francisco phase of the Mogollon.

Pottery included primarily the local El Paso Brown, with Mimbres Black-on-white, both Boldface and Classic, intrusive.

Excavation of the SU site near Reserve, New Mexico, partially done in 1939, was resumed during the summer by the Field Museum expedition of Dr. Paul S. Martin.

During the third season of the University of Arizona field school in the Forestdale valley, directed by E. W. Haury, excavations were completed at the small Carrizo phase pueblo, with earlier material underlying which connects back to the Forestdale phase, and an extremely interesting site on a hilltop on the east side of the valley was excavated. Here there were found several pithouses, and a large circular structure cut down into bedrock. The hilltop site, characterized by an early plain ware of Mogollon type, represents a pre-Forestdale-phase occupation definitely antedating, perhaps by at least two centuries, 700 A.D. The only painted pottery consists of early Hohokam intrusives. The site seems comparable in a general way to the SU site and Cave Creek.

The tree-ring conference at Forestdale in mid-July, presided over by Dr. A. E. Douglass, discussed recent developments in tree-ring work and dendrochronological techniques.

Tree-ring work by the Gila Pueblo group has continued, particularly on material from the upper drainage of the Gila, collected by E. B. Sayles, and from the Chihuahua area and the Four Corners region, collected by Deric Nusbaum. Dr. Nusbaum's beam material includes samples not only from cliff-dwellings of western Chihuahua and eastern Sonora but also from old haciendas in Durango, together with cores from living trees throughout the district. His dated material from the Four Corners includes 18th-century Navaho sites as well as Anasazi cliff sites. Sayles has completed his excavation at Dos Cabezas and is engaged in study of the San Simon branch of the Mogollon.

Excavations at the Tres Alamos site on the San Pedro by Carr Tuthill for the Amerind Foundation (Dragoon, Arizona; W. S. Fulton, Director) were carried on into June, and the collection was studied during the summer, with minor further excavations. Two adobe compounds, 36 pithouses of five main types, and a large ball court of Snaketown type, were excavated, 12 inhumations without offerings and 10 cremations with pottery vessels found, and a prehistoric irrigation ditch studied. The range of surface sherds, from Snaketown Red-on-buff to Tonto, El Paso, and Ramos polychromes, indicates a long occupation at Tres Alamos. Excavations so far indicate three or four phases between around 800 A.D. and 1450 A.D., from pithouses with red-on-brown pottery to large compounds with late polychrome ware. Of especial interest are stone objects resembling ping-pong paddles found in some number in and around the ball court. Mr Fulton has been working during the summer on the publication of the important material found last spring in a cave dug by Arnold Withers in the Winchester mountains.

The Alumnae Association of Bryn Mawr College has, this summer, been financing an archaeological expedition to northern Arizona, under the direction of Dr. Frederica de Laguna, in collaboration with the Museum of Northern Arizona, which will receive the specimens. An early Sinagua site, "Cinder Park," about twenty miles northeast of Flagstaff in the Sunset ash fall area, was excavated. It consists of a number of very shallow circular pit houses. The pottery consists of the local Rio de Flag Brown, and a good deal of Lino Gray and Lino Black-on-gray. The vessels are jars, hemispherical bowls, and bowls with small mouths; some have strap handles, and others lugs pierced for suspension. Stone specimens include almost flat metates, grooved metates with one end closed, oval one-hand manos and longer two-hand manos, hammerstones, full grooved axes, sandstone

shaft polishers and rubbing stones, chipped core choppers, chipped blades for arrows and darts, chipped drill bit, and a tubular pipe of lava. Bone objects include awls, a chisel, a scraper of deer mandible, and a tubular pipe. Trade with the Hohokam is shown by a thin shell bracelet and a sherd of Santa Cruz Red-on-buff. As far as it has been studied, the culture suggests a stage of the local Sinagua Branch, corresponding to late Basket-Maker III (Lino focus) of the Anasazi, or else a blending of the two. None of the charcoal has yet been dated.

Archaeological field work by Dr. G. C. Baldwin of the National Park Service has continued in the Boulder Dam area (though suspended during much of July and August), concentrating on Pueblo village sites and several Paiute campsites around Overton, Nevada. Starting in the fall, with cooler weather, it is planned to commence excavation at the Willow Beach site below Boulder Dam. As this site, partially excavated a number of years ago, is quite extensive and shows promise of good stratigraphy, it is hoped to secure evidence of the sequence of cultures in this area, the site running back into pre-Basket-maker times. About 125 sites have been surveyed in this area so far.

The field work of E. R. Smith, Curator, Museum of Anthropology of the University of Utah, has included the following.

An archaeological survey was carried out during the month of July in the high plateau areas of eastern Utah and western Colorado. The work was concentrated around Jensen, Utah, and Rangley, Colorado. In the vicinity of Douglas Creek, Colorado, and in Utah in the areas of Bitter Water Creek, Evacuation Creek and Sweetwater Creek, the survey discovered early and late petroglyphs and pictographs; square and rectangular masonry structures built on ledges or on the top of plateaus; cave material without the presence of pottery and with cultural material extending to a depth of over 4½ feet. A preliminary report as Archaeology and Ethnology Papers No. 6 of the Museum of Anthropology will appear this fall.

Work was also carried on for a week in cooperation with Marie Wormington of the Colorado Museum of Natural History, Denver, at the Turner Sites north of Cisco, Utah. In this connection, circular masonry structures were excavated to be correlated with Miss Wormington's material.

The work of the Museum was continued on caves near Wendover, Utah, and bottom was reached in the largest excavation at a depth of over 13 feet. A large rock fall of from 15 to 20 tons stopped work on this site for the present, but work will be continued later. At this site the oldest culture so far to date in the Bonneville Basin has been uncovered. Geologically the age has been placed at 8–10,000 years. Yuma and Folsom-like points have been obtained, many of these corresponding to the material illustrated by the Campbells in MASTERKEY, January, 1940, from another area of the Great Basin.

On the Utah-Idaho state line at Franklin, Idaho, a large cave has been surveyed and artifacts obtained by Mr. L. D. Lowe from this cave at a depth of 8 feet were studied. The artifacts are comparable to those found in the western part of the Bonneville Basin, and the lower material is identical with material found in Deadman Cave, Utah, 10 miles west of Salt Lake City (report on Archaeology of Deadman Cave, Utah to be published by University of Utah sometime in September).

During August and early September, an archaeological survey is being made of the area south of Cisco, Utah, on the Colorado river.

C. T. Hurst reports that on August 16, the third expedition of the Museum of Archaeology of Western State College at Gunnison, Colorado, completed excavations at the peripheral Basketmaker site in Tabequache Cave, in central Montrose County.

Abundant artifacts and three small cists were found, but no burials. Dates obtained from timbers from this cave are given as 348, 361, and 372 A.D. The Museum will work next year on another cave ten miles farther down the same canyon.

Marie Wormington (Mrs. George Volk) of the Colorado Museum of Natural History conducted her field class in northeastern Utah for several weeks. Betty Huscher of the same institution reports that she and Mr. Huscher continued their archaeological survey of non-pueblo remains in Colorado.

In southern and western Colorado the Huschers excavated a number of the circular hogan-type dwellings and obtained a fairly representative material culture series. Potsherd crossfinds show some sites to date back at least to Developmental Pueblo times. (*E.K.R.*)

PACIFIC COAST

Mr. Phil C. Orr of the Santa Barbara Museum of Natural History reports as follows concerning the 1941 work of that institution:

Excavations begun in February on the site of the ancient village of "Helo" in the Goleta Slough, near Santa Barbara, have been completed. Four cemeteries upon the one shell mound were excavated, which apparently represented at least three periods, or phases, of the third or Canaliño culture in this area. These three phases are not to be confused with the three cultures reported by D. B. Rogers; no trace of his two earlier cultures were encountered at this site.

The dominant traits in these three phases appear to be: First, orderly arrangement of skeletons, heads to west; burials in the shell lacked artifacts. Second, orderly arrangement, heads to west, burial in black sand, without shell (midden) deposit, presence of thin shell beads, leaf-shaped arrowheads, quantities of shell inlay, lack of basketry or basket stones, lack of household implements. Third, re-burial, no set direction for skeletons, absence of thin shell beads, presence of thick shell beads, no inlay, asphalt skirt weights plentiful, fine delicate arrowheads and bowls and cllas plentiful.

Of the four cemeteries excavated, one had been almost completely looted by "pot hunters." Another had been previously excavated by bona fide anthropologists (Olson and Schumacher). The third had been about 90% looted, but from the remaining ten per cent, which had been missed, some very excellent material was secured, including an outstanding burial on a whale-bone slab. The last cemetery was covered with six feet of shell and had never been disturbed.

"Preliminary excavations at Mescalitan Island were completed, and a period of activity and hurried excavations followed, while the construction crews for the new Santa Barbara airport began leveling the island, moving from ten to thirty yards of material at a time, with the aid of grading machinery. The writer, assisted by Messrs. B. G. Wright and Waldo Abbott of the Santa Barbara Museum staff, scrutinized nearly every load of material from the portions of the island where archaeological specimens were to be expected. Much interesting and valuable information was obtained in this way, although few artifacts were salvaged. The complete destruction of the shellmound in this case turned up an unsuspected cemetery, representing the second cultural stratum of this region. This cemetery constituted the seventh found on the island.

"Construction work across the slough uncovered four more cemeteries, none of which was previously known." (*E.W.G.*)

MIDDLE AMERICAN AREA

The first Round Table meeting of the Sociedad Mexicana de Antropologia, with Dr. Alfonso Caso in the chair, was held at Chapultepec Castle, Mexico, July 11–14, 1941. Over

sixty anthropologists, including about ten from the United States, attended. The subject, whether Tula, Hidalgo, or Teotihuacan should be identified as the Tula of legend and history, was discussed in terms of history, ethnology, archaeology, and linguistics. The archaeological relationships of Central Mexico with Oaxaca, western Mexico, and the Maya area were particularly emphasized. Papers were contributed by Acosta, Caso, Ekholm, Jimenez Moreno, Kelly, Kirchhoff, Marquina, McQuowan, Mendizabal, Noguera, Palacios, Swadesh, Thompson, and Weitlaner, while many others took part in the discussions. Conclusions acceptable to all were generalized, but the interchange of information and ideas made the meetings very successful, and has built a firmer base for Mexican archaeology. Papers will appear in a special number of the *Revista Mexicana de Estudios Anthropologicos* (Secretary: Miss Bodil Christensen, Calle del Cinco de Mayo, 46, Mexico, D. F.). The next Round Table meeting, to discuss the Olmec, will be held in 1942. (*J. Eric S. Thompson*)

Working under the auspices of the American Philosophical Society and the Carnegie Institution of Washington, Dr. Mary Butler, Research Associate of the University Museum, Philadelphia, spent February and March, 1941, in Guatemala City, preparing for publication the grave material which she excavated in 1940 at Chama in the Alta Verapaz. In April, she excavated two extensive urn burials in Nebaj, Quiche, at the instigation of Dr. J. Steward Lincoln who was making an ethnological study of that region. One of these consisted of twenty-eight large urns and jars, usually containing bones, and 165 small vessels, chiefly fine wares, set close together around and above an extended burial. The other contained twenty-two urns and seventy-seven small vessels set in the stone wall of a dirt-filled platform.

The pottery from both sites is identical in type and belongs to the Quiche phase of the middle period of the Maya ceramic sequence (Monochrome, Polychrome, Plumbate). It shows in some wares a relationship to the Chama-Chipal area to the east, and in others connection with the Zacualpa region to the southeast, but has other so far unique traits, such as a black-and-orange negative-painted ware. The masonry in ruins at Chajul and Nebaj was similar to that previously reported from the Cuchumatanes and the Baja Verapaz.

We deeply regret to say that Dr. Lincoln, mentioned in the above report, died in Guatemala City the end of April. Pneumonia, contracted in the field at Nebaj, was followed by cerebral meningitis.

Aided by a grant from the Carnegie Institution of Washington, the Middle American Research Institute of Tulane University has just published a revised 1940 edition of the map "Archaeological Sites in the Maya Area." This map consists of six sheets, each 33½ ×50 inches, the entire map being about seven by eight feet in size. The scale is 1:500,000. About two thousand sites are located. An earlier edition was published in 1924. The price is $3.00, plus 15¢ (folded) or 30¢ (rolled in tube) postage.

Another part of the same project is a card file "Index of Maya Ruins," also a revision of the file started in 1924. The cards contain full information and bibliography of each site. This will not be published but will remain at the MARI for reference.

The library of the late great Maya student Dr. W. E. Gates of Baltimore will soon be offered for sale. It contains many rare books, a number of manuscripts, probably the most complete extant file of photographs or photostats of works written in the Maya language or in Maya glyphs, and his set of Maya glyph type. Unsold copies of publications of the Maya Society passed to his sister, Mrs. McComas, 320 Hawthorn Road, Roland Park, Baltimore, Md. Copies of the *Gates Edition of Landa*, *Outline Dictionary of Maya Glyphs*, *A Grammar of Maya*, *The De La Cruz-Badiano Aztec Herbal of 1552*, and the *Maya Society Quarterly*, as well as one or two other publications of the Society may be obtained at very substantial reductions by writing Mrs. McComas.

Archaeological Researches of the Dirección de Monumentos Prehispánicos of the Mexican Government during the 1940–1941 season (information supplied by Sr. Eduardo Noguera).

Yucatan: At Chichen Itza, explorations were made, and the mound known as the "Tomb of Chac-Mool," near the Castillo, was reconstructed. At Uxmal also, excavations and repairs were made on the Pyramid of the Magician or Dwarf, and on the Monjas (Nunnery) Quadrangle.

Palenque: The archaeological zone has recently been more thoroughly explored and surveyed. Work of reconstruction and repair was done on the Palace, and on a small temple distant from the center of the zone.

Monte Alban: During the past season the East Platform was explored, and the reconstruction of Mound J was continued.

Mixtec Zone: Excavations that produced interesting results were made at Monte Negro and at Yucuñudahui.

Cholula: In the interior of the great pyramid more tunnels were made in order to follow the earlier buried structures. A local museum is being constructed to exhibit the objects and a model of the pyramid with its earlier buried phases.

Tajin and Misantla: The repair and reconstruction of the pyramid with niches known as "El Tajin" was continued, and an adjacent structure was explored. In the zone of Misantla explorations and surveys have revealed new data of considerable archaeological interest.

Tesechoacan, Veracruz: Explorations and surveys have been made for the purpose of obtaining information on the possible relations between the cultures of the Tuxtla region and those of Oaxaca.

Michoacan: The repair and reconstruction of the "yácatas" at Tzintzuntzan was continued, and data of archaeological importance were secured. In Jiquilpan, near the border of the Tarascan region, explorations were made and some structures excavated. The good results revealed a culture which differs from the Tarascan in many respects.

During the season, the Mexican Government received the collaboration of numerous scientists sent from institutions in the United States, among them Dr. Stirling, at Cerro de las Mesas, Veracruz. Dr. Isabel Kelly made explorations in Jalisco, Colima and Michoacan, and Deric Nusbaum in Durango, Chihuahua, Coahuila and Zacatecas; the latter studied especially ceramics and tree-rings. Also, the Carnegie Institution continued its investigations in the Maya region.

Sr. Pedro Armilla in June investigated the ruins of Cerro Oztuma, near Acapetlahuaya in Guerrero, paying especial attention to their strategic importance.

Among the expedition projects of the National Office for Cultural Relations with Latin America under the Institute of Andean Research are three in Middle America: one in Northeast Mexico, supervised by Gordon Eckholm; one in Western Mexico, supervised by Isabel Kelly; and one in Central America, supervised by John Longyear. Dr. Kelly will conduct investigations in the state of Michoacan and the Valley of the Rio Balsas, seeking data on the archaeological relations with Jalisco and Colima.

Recent excavations made by the Mexican Government at Tula, Hidalgo, the traditional capital of the Toltecs, have given unexpected results bearing on the relations of Tula and Teotihuacan, and may necessitate an entire revision of current opinion regarding the Toltecs and Teotihuacan.

Dr. Isabel Kelly has supplied the following report on her work in Jalisco:

The past season, from November 1940 to June 1941 was spent chiefly in a surface survey of various parts of western and southern Jalisco. The areas are indicated below;

and although the sherd material is not yet analyzed, certain general cultural affiliations are evident.

Tecolotlan, Tenamaxtlan, Ayutla, Atengo, Tepospisaloya, Union de Tula: These are some of the key spots in the great area known in the 16th century as the Pueblos de Martin Monje. The whole zone appears to have been more or less uniform culturally and, ceramically speaking, was one of modest culture. It may be expected that the Cuautla-Mascota stretch will align with this zone.

Autlan, El Grullo: Further surface investigation was made here in an effort to identify 16th century villages with archaeological sites. However, pre-white occupation was so nearly continuous that it was impossible to isolate settlements.

Tuxcacuesco, Toliman, Zapotitlan, Apulco, San Gabriel, Tapalpa: This is the area of the middle Armeria drainage and of the the northern and western flanks of the great volcanoes of Colima. A heavy aboriginal population is indicated along the Armeria river, and the entire zone belongs definitely to one of the major ceramic complexes of Autlan, that of Autlan polychrome. At the same time, outright Colima material is represented, surprisingly enough, as far upstream as Tuxcacuesco.

The extent of the ware identified as Autlan polychrome is genuinely impressive. It occurs as a major decorated ware from Autlan southeast to Zapotitlan; east to Sayula and Ciudad Guzman; and southwest to the coast at Sihuatlan. Moreover, the Periquillos decorated ware of the lower Armeria, of Colima, is definitely a variant of Autlan polychrome. Associated wares vary, but Autlan polychrome remains distinctive and strong numerically.

Purificación drainage: From Villa de Purificación to La Huerta to Apazulco. Despite 16th century accounts, the upper Purificación seems to have been a pretty unimpressive culture to judge from its ceramic remains. And the same may be said of the rugged country immediately south, that which drains to the Rio Sihuatlan (Cuautitlan, Cuzalapa, etc.). The mouth of the Purificación, however, shows coastal affiliations and is to be grouped with the Quismala material, from the mouth of the Rio San Miguel (the next drainage northwest).

Sayula, Atoyac. Although Autlan polychrome is the dominant decorated ware of one site in the Sayula basin, the remaining sites, of which there is a vast quantity, show a well developed, specialized, local culture.

Dr. John. M. Longyear III, of the Peabody Museum, Harvard University, spent two months in Panama in the early months of 1941. His purpose was to secure data on the sequences and associations of the various ceramic types in Chiriqui. Very large collections from Chiriqui exist in many museums but nothing is known regarding their associations. Local conditions made it impossible for him to carry out his project as planned, but in the region Dr. Longyear studied several large archaeological collections which are fairly well documented, and learned of the location of several new grave sites. The province of Chiriqui seems to be divided, topographically and culturally, into three regions, Lowland, Upland and Highland. Dr. Longyear noted the degree of frequency of the various pottery types in these three regions. In the characteristic wares the Lowland and Highland areas seem to be similar, the Upland area divergent. The less common wares seem to be missing in the Lowland area, but found in the Highland and to a lesser extent in the Upland area. Also in the characteristic wares, the Lowland products seem to be inferior in the qualities of shape and design to those of the Highland.

Mrs. Doris Zemurray Stone of the Middle American Research Institute of Tulane University has made an archaeological survey and study of tribal distribution and boundaries on the north coast of Honduras, and is engaged in a similar study of central and southern Honduras, as well as a preliminary survey of the archeological zones of Costa Rica. Her paper on the archaeological survey of the north coast is being published as a Memoir of the Peabody Museum of Harvard. (*J.A.M.*)

BOOK REVIEWS

Indians of the Americas. EDWIN R. EMBREE. (pp. xi+260, 66 illustrations and maps by HOWARD GRIEG. Boston, Houghton Mifflin Company. 1939.) $2.75.

On receiving a book for review, the reviewer first tries to determine what kind of book the author intended it to be. *Indians of the Americas* has no preface, so I first sampled a few pages, searching for the basis of judgment which a preface might have provided. The *Prologue*, an impressionistic sketch of the white man's arrival and the decline of the Indian, could be added profitably to a high school history text. The chapters entitled *Life on the Western Plains* and *The Pueblos of the Southwest* are charming, imaginary narratives of Indian life, the latter adapted from Bandelier's *Delight Makers*. Among the many stylized drawings by Howard Grieg, I saw Hiawatha in his canoe, Iroquois dancing in Plains war-bonnets, and found the label "Inca" under pottery which is not of Inca style. I had just concluded that the book was, as the title page indicates, an "historical pageant," and should be judged as pageantry, when my attention drew up with a shock at the author's final note. Here he says: "In preparing this book I have not relied simply on my own knowledge of Indians. I have built the story upon the wealth of detailed scholarship which fortunately has been recorded by hundreds of students who have devoted years and decades to studies of individual aspects of Indian life. To make sure that my descriptions and interpretations were accurate, I submitted my text, chapter by chapter, to scholars who are most competent in the various fields." Embree has often mentioned the "scholars," anonymously but respectfully. Now he tells us who some of them are. His list includes twenty-one of the foremost names in the field: anthropologists, archaeologists, research administrators, directors of Indian affairs. "Their patient revisions," he says, "have done so much to make the book as accurate as it is."

Such testimony makes the reviewer tremble, but the word "accurate" gives him a chance to exercise the meanest of his faculties—to charge the author with factual errors, overstatements, and assertions unsupported by evidence.

About three hundred Sioux were massacred by white troops at Wounded Knee in 1890, but they were not all "dumped into a common grave," as Embree states on page 11. If I read my Mooney[1] aright, less than a hundred and fifty were buried together. There are not "many proofs that Indians are of a single stock—Mongoloid" (p. 16). The "habitable parts of North and South America" were never "filled" with Indians (p. 17). Maya temples were anything but "spacious" in the common meaning of the word (p. 24).

In his chapter on Peru, Embree mentions in passing that the Incas "built their great civilization" on the earlier cultures of Chimu, the Tiahuanacans, and the Chanchas. From then on, however, he writes as if the Incas had the only high culture in Peru. He probably knows better and is only trying to simplify, as one does in a freshman course; but this is the least instructive kind of simplification. By omitting to name Manco, Sinchi Rocca, quipucamayus, Intip Raymi, Huaracu, Coya Raymi, and by giving Chimu, Nazca, Recuay and Tiahuanaco their proper places, he could have spared the reader some bewildering vocables and still have kept the right perspective in Peruvian cultural history.

When he states (p. 95) that the Incas "were the only Indians who kept domestic animals," he is forgetting the dog and the turkey; and may not the llama and the alpaca have been domesticated by non-Inca peoples of the Andes? He tells us (p. 107) that "wine" was poured out by the Saca Inca at the Feast of the Sun, but Garcilaso[2] says only

[1] Mooney, James, *The Ghost Dance Religion*. Annual Report, Bureau of American Ethnology, Vol. 14, Pt. 2, 1892–93, pp. 868 ff.

[2] Means, P. A., *Ancient Civilizations of the Andes*. New York, 1931, p. 369.

"the beverage that they drink," and it was probably a kind of beer. "Much of the copper mined in Peru," we read on page 100, "was mixed with tin and thus formed a natural bronze tougher and more durable than pure copper." This does not give the Incas their due. C. H. Mathewson[3] in 1915 and Erland Nordenskiöld[4] in 1921 showed that Peruvian smiths alloyed copper with tin intentionally, if not in careful proportions.

On page 183 Embree says: "The Iroquois during the century from 1600 to 1700 had established a military empire larger in territory than that of Rome at its greatest period." Ten minutes with an encyclopedia would have corrected him. Even if the Iroquois had controlled all the land from the St. Lawrence south through Tennessee, and from the Atlantic to the Mississippi—which they never did—they could have claimed scarcely half a million square miles. The Roman Empire, excluding Britain and the African colonies, covered more than a million. Embree's fondness for Indians leads him to commit a similar blunder on page 84, where he affirms that "no enlightened person" believes that the Spanish conquest of Mexico was "a triumph of civilization over barbarism"—as if to place Aztec culture on a level with the Spanish Renaissance!

Many other passages seem doubtful to me, but I would not openly question them if the "scholars" had not allowed so many downright errors to slip by. Was the Caracol at Chichen Itza an astronomical observatory? (p. 31). Ruppert[5] suggests that this building "might have served as a military or civil watch tower, or for communication by means of signals," but concludes that "any statement as to the use of the structure is conjectural." Were the Aztecs "as much interested in observing the movements of the heavenly bodies as the Maya were?" (p. 59). What impression will a beginner draw from the unqualified statement (p. 124) that the Haida of the Northwest Coast tattooed "on their hands and arms the family name and connection"? Was "everything" the Indians did "influenced by respect or fear for the creator and for the mysterious forces all about them"? (p. 241). Did the native of Central America chew chicle, as Embree implies on page 243? Nordenskiöld[6] in 1933 lists cochineal dye as a Middle American feature absent from South America; Valette,[7] Means,[8] and Embree in the present book (p. 98), say that the Peruvians used it. Who is right?

But I have written too long in this unfavorable tone. Embree's chief mistake was his pretension to accuracy. If there can be such a thing as an "accurate pageant," Embree has not created one; and he should have ended the job, dramatically, with his chapter on *Indians in a White World*, where he allows them "a brilliant and colorful role."

A book does not have to be accurate in order to be good, and I hope that my trifling objections will hinder no one from reading and enjoying this one. Embree's work may be recommended especially to young people, who, though the author found it "impossible to make up a useful list of books that are both authoritative and interesting for the general reader," may be led to read the works of the "scholars." Embree as a writer, and Grieg as an illustrator, have drawn some very attractive pictures. Grieg's Indians and Indian scenes are not as convincing as his figures of Indian *things*, and Embree's style often lacks flavor. If something is truly "colorful" it deserves a much better adjective. I feel sure, however, that none of these little frailties will queer the book with the readers for whom it was intended.

WALTER CLINE
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[3] Mathewson, C. H., *American Journal of Science*. Fourth Series, Vol. 40, 1915, pp. 525–616.
[4] Nordenskiöld, E., *The Copper and Bronze Ages in South America*. Göteborg, 1921.
[5] Ruppert, Karl, *The Caracol at Chichen Itza*. Washington, 1935, p. 275.
[6] Nordenskiöld, E., in *The American Aborigines*. D. Jenness, editor. Toronto, 1933, p. 291.
[7] Valette, M., *Journal de la Société des Américanistes de Paris*, Vol. 10, 1913, pp. 43–46.
[8] Means, P. A., *op. cit.*, p. 467.

Prehistoric Antiquities of Indiana. ELI LILLY. (pp. 293, pls. 88. Indianapolis: Indiana Historical Society, 1937.)

This exceedingly handsome volume of small quarto size, is a delight both to the eye and the mind. Superbly made and generously illustrated with full page plates, it tempts the fancy of even those not especially concerned with archaeology. This appeal to the layman, to whom the work is primarily addressed, is heightened by the narrative style of the author.

The survey maps and photographic depictions of representative Indiana sites are the product of expert hands, while the lithographic reproductions of assemblages of type Indiana artifacts, uniquely displayed against varying backgrounds of sand, stone, tree and mound earth sections, fabrics, bark, furs, and even illustrations suggesting probable uses, are the creation of an artist-photographer.

After a well-knit summary of the prevalent opinions respecting the origin and antiquity of the American Indian, Mr. Lilly presents in the space of two chapters a concise picture of the outstanding mounds, earthworks, quarries, village and burial sites of Indiana, and a résumé of the state's prehistory, as known at the time of writing, concluding on the probable priority of a long-headed hunter-fisher population, seemingly related to the Ozark Bluff Dwellers and the Shell Mound Culture folk of Kentucky, Alabama and elsewhere, whose vestiges were brought to light by E. Y. Guernsey in the basal layers of extensive stations at Clarksville, near the falls of the Ohio.

Subsequently came Adena and Hopewellian groups, whose activities are particularly well recorded in the conical mounds and mound-earthwork complexes respectively, found in the valleys of the Ohio, Wabash, White, Whitewater, Illinois, Kankakee and St. Joseph rivers. Certain components of these cultures, like the Fudge Mound of the Winchester group and the Nowlin Mound, have been expertly examined by Frank M. Setzler and Glenn A. Black, under the auspices of the Indiana Historical Society.

Other, and presumably later, great mound groups, notably the Angel series of flat-topped structures with associated earth stockade line, are to be referred to the Middle phase of the Mississippi pattern and are related to the famous Cahokia (Illinois) and Aztalan (Wisconsin) stations. They are particularly numerous in the southern tier of Indiana counties, where also occur large village and burial sites manifesting relationships with the Oneota aspect (upper phase, Mississippi pattern) farther north.

While material attributable to the Woodland pattern is abundant in Indiana, as Mr. Lilly observes, few stations of this horizon seem to have been explored.

The reviewer would question the statement, based on Brinton (p. 35) concerning the early passage of the Lenapé through Indiana en route to the east. He is not aware of any convincing evidence of the presence of this people in Indiana or vicinity prior to the latter half of the eighteenth century.

Among the unsettled problems of Indiana archaeology is the authorship of the stone mounds occupying the highlands along its southern border and generally similar in structure and content to those distributed along the Ohio and its tributaries from the vicinity of Pittsburgh to Louisville, Kentucky.

More than half of Mr. Lilly's book is devoted to a description of artifact types found in Indiana and is arranged under such headings as *Flint Objects, Abraded and Ground Stone Objects, Stone Ornaments and Ceremonials*, etc., with appropriate subdivisions. Here is set forth a large amount of carefully gathered information relative to function, provenience and distribution, the source being indicated, as throughout the work, in ample footnotes.

A bibliography of twenty-one pages on Indiana archaeology completes the volume, of which Mr. Lilly may well be proud.

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The SU Site—Excavations at a Mogollon Village, Western New Mexico, 1939. PAUL S. MARTIN. With Reports on Pottery and Artifacts by JOHN RINALDO and Appendix on Skeletal Material by MARJORIE KELLY. (Anthropological Series, Field Museum of Natural History, Vol. 32, No. 1, maps 11, pls. 42, glossary, pp. 97. 1940.)

This report by Dr. Martin and collaborators is the outgrowth of one season's investigation in the SU Ruin located in the Upper Gila area of western New Mexico. It presents new and additional information on the early beginnings of the Mogollon culture. Its appearance so promptly after the close of the field work (1939) sets a most admirable and valuable precedent. The *Introduction*, the chapter on *Architecture* and the *Summary* are the work of Dr. Martin. Chapters 3 and 4 deal with artifacts and pottery with John Rinaldo the contributor. There is also an appendix by Marjorie Kelly on the skeletal material. The format is superb. Objects of material culture, and ruin views, are brought out with detail and sharpness by the process of colotype. The arrangement of the text is to be praised—all the data relating to architecture, artifacts and pottery are concise and tabulated under topically headed descriptions and in an index. It is easy to find any item without wading through an interminable amount of text.

The SU Site, situated seven miles west of Reserve, New Mexico, is a Mogollon site consisting of pit houses and surface houses. In 1939 seven of the former and one of the latter were excavated. Pit houses were shallow, round, or variations of round, and had side entrances to the east (except House G). House floors were of gravel and adobe and contained pits of various shapes and sizes. Walls of all houses were of native earth. The arrangement of roof supports was not uniform and did not correspond to arrangements in later Mogollon sites. Three main types of pottery were found: Alma Plain, which comprised more than one-half of all pottery found; and two new types temporarily designated as Unpolished Brown and Polished Red. About 1200 sherds were recovered. Painted pottery is entirely absent except for a few pieces found in a reoccupied pit house.

The SU Site was not rich in artifacts, a total of 400 being found. These comprise metates, mortars, manos, mauls, chipped stone objects, shell bracelets, pendants, beads, and miscellaneous objects of clay and bone. The general character of the agricultural implements leads Rinaldo to believe that the Mogollon peoples had only begun to practice agriculture at this stage. With this belief the reviewer cannot agree. One hundred and seventy three hand stones and milling stones were taken from eight houses and numerous trenches. Many of these are well finished and approximate the type found in Pueblo III ruins of the same region. At no time in the Reserve district did implements associated with agricultural economy take on the sophistication they did in other areas. The finding of charred corn, the quantity of agricultural implements, and the rarity of chipped stone tools suggests that the Mogollones were well beyond the beginning stages of agriculture.

Twenty-six burials were found. Five of these were located in trenches and twenty-one in houses or house pits. Burials were flexed. Of particular significance is the dearth of mortuary offerings, apparently a characteristic, if not diagnostic, trait of this culture. Mogollon sites considerably later than the SU adhere to the same mortuary and burial customs. Skeletal materials were too badly broken to allow of many measurements. They differ from the Mogollon Village Skull in many respects though I doubt if there is a lack of "morphological" resemblance as Miss Kelly states. I fail to see why a comparison with the Starkweather crania was not made. With so few Mogollon crania known it would be well to have as large a comparative series as possible. The physical type is Pueblo id.

Since Haury's postulation of the Mogollon as a third culture entity (ranking with Anasazi and Hohokam) several writers have questioned its elevation to this status. I, for one, have strongly felt that the evidence does not support it, and although Martin's findings at the SU Site have shed new light on the problem, and modified my point of

view, I am not yet ready to accept it as an independent complex. Although Martin has refrained from making any synthesis on the affiliations of the SU Site, in both the introduction and the text it is quite apparent that he has accepted the Mogollon as a basic root and given it a status equal to but independent of Anasazi and Hohokam. It is true that there is a marked ceramic distinctiveness to the Mogollon and minor differences in house types. The artifacts are not distinctive, most of those found at the SU site have a wide distribution throughout the Southwest. Are we to believe that the Mogollon is the basic horizon for the dissemination of these wide-spread traits?

Unfortunately, the wood that Martin found did not lend itself to dendrochronology dating so no dates were secured. Pottery types indicate an age greater than Georgetown phase and place it as the earliest Mogollon site excavated to date. Martin's guess is that the SU Site would date about 500 A.D. or earlier. He does not state why he thinks so. It is unfortunate that both the Georgetown and pre-Georgetown phases cannot be more accurately dated.

I noted but one error in the manuscript. On page 64 two type B projectile points are tabulated whereas the accompanying figure (29) illustrates three. I am also surprised at the large number of floor sherds in some of the pit houses. Pit house E had 647 floor sherds. Is the reader to believe that these rested directly on the floor or occurred in the fill to a height of several inches above it? A note on this would have been enlightening.

The SU excavations have given us a very readable report, notable chiefly for the new and additional data it brings to light on the Mogollon problem. Let us hope that Martin continues his work in this area and that he supplements this report with others as noteworthy.

PAUL H. NESBITT
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The Black Pottery of Coyotepec, Oaxaca, Mexico. PAUL VAN DE VELDE and HENRIETTE ROMEIKE VAN DE VELDE, with a foreword by F. W. HODGE. (Southwest Museum Papers, No. 13, pp. 1–43, pls. 39, fig. 1. Los Angeles, California, 1939.)

Competent accounts of the manufacture of pottery by the methods probably employed in prehistoric times are few and far between. Years of familiarity with the inhabitants of the village of San Bartolo and a sympathetic and intelligent interest in their culture rather than academic training has enabled the authors to prepare a well written description of the local ceramic industry.

This paper is not a bare recital of cultural facts but is a moving story of the place the industry has in the life of the people and of their attitude toward it. The fundamental technical factors involved are presented in logical order. The place where the clay is obtained, the tools employed, and the preparation of the clay are all given adequate treatment. However, one can not but wonder whether tempering material was used, since no mention was made of its use by the writers. In the actual shaping of the vessel one is impressed by the resemblance to the Maya kabal of the use of two sherd fragments to provide a turning platform. The tools and the methods employed in the stages of shaping, surfacing and decorating prepare the vessel for drying and firing. The vessels are placed in a primitive kiln with considerable care and attention devoted to actual firing and the subsequent cooling. The vessels are then ready for market.

Students of prehistoric sherd fragments will take comfort in the concepts involved in the apparent stability of the ware, the relative consistency with which specific shapes are made for specific purposes and the reliability with which the products of the village can be segregated from that manufactured in other communities.

Archaeologists who ponder over the cultural significance of the sherds which they

excavate would do well to give this short paper a careful reading. May the time soon come when a comparative series of similar studies will be made on comparable groups in Mexico which will provide evidence for more accurate generalizations as to the role of pottery in a living culture of this type and help in segregating the pre-conquest from the post-conquest technique.

Probably the greater part of the text is given over to sections on the present population of Oaxaca, the pre-conquest history of the Zapotecans, and the early Spanish Conquest of the area. The illustrations, which are excellent and well chosen, bear entirely on the subject as announced in the title. The reviewer would have appreciated a small map locating San Bartolo Coyotopec in the state of Oaxaco and an even smaller map of the location of Oaxaco within Mexico.

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An Herbarium from the Allegany Senecas. WILLIAM N. FENTON. (Historical Annals of Southwestern New York, Lewis Historical Publications Co., Inc., Chap. 51, pp. 787–796, fig. 1. New York, 1940.)

This preliminary note on Seneca ethnobotany consists of a short historical introduction, a note on the methods of field work, and philosophical considerations of Seneca ideas of plant taxonomy, morphology and ecology; Seneca procedures and methods of herb collecting; the variation and transmission of botanical knowledge among the Senecas; and several other points. The usefulness of ethnobotanical information in the study of several cultural aspects of Seneca ethnology is emphasized briefly, and the author indicates that "this study is only a springboard for an understanding of Iroquois disease concepts, diagnosis, and therapy, as aspects of the total Iroquois culture pattern."

Although the tone of the article is completely anthropological, there is ample evidence that it is founded upon sound and extensive botanical work. Only about twenty-five species are considered in the present contribution, but "a basic herbarium of some 180 odd medicinal plants" was secured. The ethnobotanist looks forward with enthusiasm to the publication of a list of the Seneca uses of these plants. This information would help fill in a serious gap in ethnobotanical knowledge. The unadorned enumeration of plant uses is fundamental and essential to ethnobotanical progress, and the quality of observation and interpretation in this preliminary paper should foreshadow a valuable contribution to our knowledge of North American Indian plant remedies.

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Bulletin of the Texas Archeological and Paleontological Society, Vol. 12. (articles 11, pls. 44. Texas Archaeological and Paleontological Society, Abeline, Texas. 1940.) $3.00.

Volume 12, the 1940 Bulletin of the Texas Archeological and Paleontological Society, is devoted entirely to archaeological subjects. Although seven of the papers are concerned with specific archaeological problems in Texas, there are three papers dealing with the archaeology of Louisiana, Arkansas, and Europe, respectively. This bulletin is well edited, has pleasing typography and, in general, the illustrations are clear and well captioned. In many of the articles, section or paragraph headings are of considerable assistance to the reader. The five papers most interesting to this reviewer were as follows.

"Pictographs of Indian Masks at Hueco Tanks" by FORREST KIRKLAND presents a general classification of the pictographs at this site and a description of the mask paint-

ings, and compares them with Pueblo katchina masks. Mr. Kirkland concludes that the resemblance is indicative of only a very general relationship. The paper is well illustrated.

"House Types Among the Caddo Indians" by CLARENCE H. WEBB is a description and interpretation of the stratigraphy of house types in a northwest Louisiana prehistoric Caddo site. Available archaeological and ethnological evidence has been presented in his comparative sections. The oldest house at the Belcher site was a square, outlined by wall trenches and post molds; the younger houses were round and outlined only by post molds. Although all of the pottery associated with the houses was indicative of Caddo, there was a shift or development from straight line incised decorations to curvilinear engraved designs. This article is concise, well written, well organized, and plentifully illustrated with photographs and ground plans.

"A Survey of the Historic Earthenware of the Lower Arkansas" by S. D. DICKINSON and S. C. DELLINGER presents the ceramic complex which Dickinson and Dellinger believe to be historic Quapaw. That the complex is historic has been proved by its association with European trade artifacts. Further, the sites were in the area alleged to have been occupied by Quapaw or Akancas in early historic times. There is a discussion of the influences from historic Caddo, Natchezan, and Middle Mississippi as well as a presentation of some ethno-historical supporting evidence. Examples of the pottery are illustrated.

"Tubular Pipes and Other Tubes in Texas" by A. T. JACKSON is a study of the distribution of different types of tubes in Texas. These pipes and tubes were made of fired clay, stone, reed, and antler. Dr. Jackson discusses their function, distribution, temporal position, and cultural context when such information is available, although in most cases it is rather scanty. His comparative section would have been enhanced by the addition of the Adena tubes, the Tchefuncte tubes, and the Coastal and Vine Valley tubes. On the other hand, archaeologists working with tubes of these cultures will be interested in the Texas specimens. The content of the article is particularly well organized and the illustrations are clear.

"Flaked Weapon Points" by E. B. RENAUD is a presentation of the sequence of flaked point types in Europe. Upon the basis of technique of manufacture and form he compares Yuma-Folsom points with those of the Solutrean culture. The article is illustrated.

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Prehistory of El Rito de los Frijoles, Bandelier National Monument. J. W. HENDRON. (Southwestern Monuments Association, Technical Series, No. 1, 13 diagrams and charts, 40 plates. Coolidge, Arizona, May 12, 1940).

The information contained in this report was obtained as a result of Park Service stabilization work on four sites, all in El Rito de los Frijoles, New Mexico. They are: the Large Kiva, the Ceremonial Cave, Tyuonyi (the big community house), and the Long House. Architecture, pottery, and tree ring dates are the main subjects of discussion.

Southwestern Monuments Association has developed a policy of acquainting interested persons with results of the general program of conservation and research accomplished by the staff and co-workers of the Southwestern National Monuments. It is planned to have other technical and popular papers follow this, a most commendable program, and one urged by this reviewer for several years.

One of the most satisfying portions of the paper is the *Foreword*, consisting of a good summary review, brief, but sufficient to place the subject of this paper geographically, temporally, and culturally in a comparative background. Each of the four sites are then discussed in separate chapters, followed by a summary chapter.

The notation and evaluation of tree ring dates derived here, and compared to other sites, supplemented by dating with ceramic complexes, is a most welcome addition to the history of this section. There is a tendency to stress the finding of a few early pottery types, and the use of the term "Affinis Wiyo" is a makeshift and somewhat confusing arrangement, but these are minor criticisms. In general, the sites are late prehistoric and early historic, with a P.IV and P.V culture.

The paper as a whole is not organized in a rigid, or definite pattern, and there is a tendency to theorize in explanation of detailed features, and to ramble, but in general it is profitable reading. Diagrams, plans, sections, maps, charts, and restorations are exceptionally well done and well presented. The best of the lot are the graphic pottery charts showing number distribution of types, foreign pottery types, house types, time, culture stage, and occupation periods with maximum occupation time pointed out. All of this information is cleverly correlated on each chart. There is a good summary at the end of each chapter dealing with sites, and a general summary at the end of the paper.

The report is a definite contribution to the archaeology of this section, and Southwestern Monuments should feel encouraged to continue the good work begun here.

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Pioneers in American Anthropology: The Bandelier-Morgan Letters, 1873–1883. LESLIE A. WHITE (Coronado Cuarto Centennial Publications, 1540–1940, Bandelier Series. 2 vols., pp. xv+272, and viii+266. Albuquerque, The University of New Mexico Press, 1940.)

These handsome volumes worthily, and most appropriately, commemorate the Bandelier centenary as part of the Coronado Cuarto Centennial celebration. The bulk of the material presented (Vol. 1, pp. 109–272; Vol. 2, pp. 1–255) consists of one hundred and sixty-three letters, almost all of them written by Bandelier to Lewis H. Morgan, the remainder being addressed to his widow. Unfortunately, Morgan's share in the correspondence seems to be irretrievable, but, behind the scenes, he plays the attractive part of the patron saint who encouraged Bandelier's first faltering steps in original scholarship. Morgan's eminence in contemporary intellectual life is clearly indicated by the references to his presidency of the American Association for the Advancement of Science and to his successful exertions on Bandelier's behalf with Putnam, Norton, and the editor of *The Nation*. In this respect, the volumes corroborate the evidence of I. VINNIKOV'S *Materials from the Archives of Lewis H. Morgan* (Academy of Sciences, USSR, Moscow, 1935), containing letters from Bachofen, Henry Adams, Darwin, Maine, and others.

As to Bandelier, his correspondence reveals the personality remembered by the reviewer, who was one of the handful of his first auditors at Columbia University, 1904. After the Ciceronian periods of his inaugural lecture, Bandelier displayed a charming simplicity, a quaint, foreign flavor in speech and manner, an amazing erudition, and an equally striking vehemence ("that d— liar, Sir Clements Markham"). The human documents before us illustrate his partisanship, his querulousness, a morbid susceptibility to real and fancied slights, a heavy jocularity, but also his deep attachment to his family, his unbounded zest for learning, his whole-souled devotion to a great cause and a great master.

In his editorial capacity, Professor White has cleared up many obscure points in Bandelier's life, and corrected some common misconceptions. What is more, his critique of the Morgan-Bandelier view of Mexican society, about which much of the correspondence revolves, is admirably balanced and convincing. If he could only extend the same

spirit to the whole of Morgan's achievement, his valuable historical studies of that important figure would gain in definitiveness. In the present work, Professor White sporadically succumbs to a melodramatic conception of his hero, but his periodic onslaughts against the powers of darkness—the largely imaginary calumniators of Morgan—do not seriously mar his highly creditable performance. Let him take comfort in Dr. Johnson's saying that no man was ever written down except by himself, and in the unquestionable fact that the solid part of Morgan's contribution stands generally recognized.

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The Maya and Their Neighbors. Dedicated to Alfred Marston Tozzer. (D. Appleton-Century Company, N. Y., 1940. Pp. xxiii+606, 40 figs., 11 tables, 20 plates. $6.00.)

Thirty-four scholars, all ex-students or colleagues of Dr. Alfred Marston Tozzer, have produced this unique volume. Unlike the ordinary anniversary volume, the thirty-four papers have a common theme in Middle American Archaeology. Consequently, this book is an outstanding contribution to this field of study. Much work has been done in Middle America and related fields. The literature is immense, but scattered, and résumés are few. *The Maya and Their Neighbors* presents an up-to-date, authoritative basis for study of the Middle American field.

The volume is likewise unique in having a final chapter by Dr. A. L. Kroeber which forms a critical review and summary of the contributions in terms of broader New World problems. Consequently, little is left to the reviewer except a brief description of the contents.

Although nominally based on Maya archaeology, the papers cover a wide territory. Actually four parts are included. The first, "Background of the Maya," presents the racial, geographical, and linguistic setting in Middle America. The second part, "The Maya," includes résumés of various Maya fields, and special discussions of epigraphy, calendar, architecture and ceramics. A single paper on Maya ethnology presents the problem of establishing post-Conquest divisions in the study of the contemporary peoples. Part three, "The Northern Neighbors of the Maya," covers, archaeologically, Mexico, the Southwest, the Southeast, and the Eastern United States. The résumés point out possible Middle American influences in these marginal regions. Part Four, "The Southern Neighbors of the Maya," attacks the elusive question of Andean relationship to Central America from a number of angles.

It seems unnecessary to extend this review to each of the thirty-four contributions, particularly in the light of Kroeber's concluding chapter. The importance of the book is self-evident. The linguistic map and the comparative chronological tables are invaluable to students of the field.

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Anasazi Painted Pottery in Field Museum. PAUL S. MARTIN and ELISABETH WILLIS (Anthropology Memoirs, Field Museum of Natural History, Vol. 5, Chicago, December 31, 1940.)

In the last decade of the nineteenth century and the first decade of the twentieth century, the Field Museum had many expeditions in the Southwest, no reports of which have ever been published. From these expeditions there are on the shelves of the Museum

5000 whole pieces of Anasazi (Basket-Maker-Pueblo) pottery. The authors have had them photographed and presented 900 of them in a picture book on 124 full page plates. The scope of the work included the decorated pottery of the Kayenta Branch, Mesa Verde Branch, Chaco Branch, Cibola Branch, and Salado Branch of the Anasazi Root of Gladwin. The pottery is roughly classified into generalized types, and a brief one or two pages of text discusses the pottery of each Branch. A map shows the distribution ofthe sites, mostly in northeastern Arizona, northwestern New Mexico and southwestern Colorado.

The book loses some of its value to archaeologists because a few of the types have not been determined accurately, and so the book must be used with great caution in research problems. For example, under Tusayan Black-on-white, quite a rare type of the 1200's, are included Flagstaff Black-on-white and Walnut Black-on-white of the 1100's and Padre Black-on-white and Dogoszhi Black-on-white of the 1000's. Moreover Walnut Black-on-white and Padre Black-on-white have different cultural associations from Flagstaff and Dogoszhi Black-on-white. The resurrection of Gladwin's name Sagi Black-on-white for Kayenta Black-on-white of Kidder is most unfortunate. The latter is not only in better use but also has priority.

The authors are to be congratulated in arranging the material culturally by the Gladwin system, making the pottery available to the public in a systematic form. Although archaeologists must use the work critically, it will be of great value to students of art and to those who are teaching the main outlines of southwestern archaeology.

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Archaeological Studies in the La Plata District, Southwestern Colorado and Northwestern New Mexico. EARL H. MORRIS, with appendix "Technology of La Plata Pottery," by ANNA O. SHEPARD (Carnegie Institution of Washington, 1939.)

This report is the description and analysis by Earl Morris and Anna Shepard of evidence collected intermittently by Morris during a quarter of a century's work in the La Plata district of the San Juan drainage. The region covered falls mostly into the Mesa Verde cultural division of the San Juan but extends also, along the lower La Plata, down into the Chaco area. Much of the material dealt with antedates the 12th century A.D. and consequently the formal Mesa Verde-Chaco distinction, based as it is largely on P III developments, applies in this report only to the later sites.

This monumental work is the finest single report yet to come out of the Mesa Verde area. It is of great importance not only to students of the prehistory of the San Juan but to all workers in the Southwestern field and to archaeologists generally. I base this opinion on the following reasons: (a) The number of sites excavated, which is greater than our entire previous total of sites competently dug and reported in the region; (b) The range of the types of sites examined, which includes sites from Basketmaker III through Pueblo III with many minor varieties within the periods; (c) The splendid, extensive historical reconstruction by Morris in the introduction, which presents a vital, functional picture of the prehistoric inhabitants based upon sound observation and reflecting the author's intensive knowledge of the ecology of the area; (d) The very pertinent remarks by Miss Shepard on the nature and use of technical analysis of pottery, which will be of value to all students occupied with problems of ceramic classification and terminology; and (e) the clearly reproduced illustrations of artifacts, which number 222 plates and 42 text figures and give us a magnificent body of comparative material.

The scheme of the report makes it easy to use. It begins with concise summaries of the Pecos and Gila Pueblo classifications of Southwestern cultures; followed by a short account of tree-ring work and a statement of the physiographic history of the Pueblo area particularly as it affected farming conditions. Then comes a detailed summary of our knowledge of the San Juan by culture periods; a factual description of the sites excavated and an analysis of the artifacts found. Pottery receives the most attention among the latter, but it is gratifying to note that tools and ornaments of stone and bone are also thoroughly described with many observations and speculations as to methods of manufacture and use.

Miss Shepard's appendix describes her technological study of the pottery. It begins with a description of her analytical technique; the materials used by the prehistoric peoples in making the pottery; and the manner in which it was made. In connection with the latter, the results of extensive firing experiments are given. This is followed by a description of the most important wares arranged by chronological culture periods and a consideration of intrusives. The conclusion summarizes her work on Basketmaker III glazes, the introduction of slip technique in Pueblo I, the introduction of sherd temper in Pueblo II, and a table showing the chronological distribution of tempers and paints. The latter effectively eliminates the theory that organic versus inorganic paint composition has a simple geographical correlation but shows that significant differences do exist at any given time, although in a much smaller compass than generally supposed For example, the small La Plata area was divided four ways. In early Pueblo III organic and inorganic paint were found rather evenly distributed while in late Pueblo III only organic paint was used. Variability of paint, correlated in the table with rock and sherd tempering, exists somewhat unpredictably in all pottery periods except Pueblo I, when only inorganic paint and rock temper were found.

In conclusion, Miss Shepard makes a statement which seems to me to be of great importance and which should be considered seriously by those who make taxonomic classification their *only* approach to ceramic problems. "One of the strongest arguments in favor of technological analysis is that it necessarily forces one to consider the human element. We can describe a potsherd by reference to its color, hardness, pattern, and so on, without giving a thought to the way it was made, but once we attempt to describe how it was made we must visualize the potter's environment and her particular limitations."

This report will be criticized by some because neither Morris nor Shepard made any attempt, in print, to tie in their pottery findings with recent work in other parts of the San Juan. Extensive systematic studies of a taxonomic nature have been made recently and the results published in manuals. Whether or not one agrees with the philosophical or scientific assumptions behind these more subjective analyses, they have proved useful and are widely used. Consequently, it would seem wise for all workers in the field to note apparent similarities with "named types" in so far as the published taxonomic descriptions permit one so to do.

Part of this criticism must be tempered by a recognition of a mechanical bottle-neck in our publication system. This report was written years before it was published. I read a draft of the introduction in 1933. The question as to how long a report should be held up for revision is one to be decided on the terms of individual experience. We are still awaiting a number of large reports, including one of my own. Personally, I am glad the publication was delayed no longer, even though it does not draw comparisons with sites of similar period excavated by Paul Martin in Montezuma County, Colorado. Comparisons between the two are easily made, particularly since each have published plans and photographs so fully.

Morris' excavations and the deductions he draws from them are important for many reasons, chief among which are the following: (1) He gives a full report of excavations,

partially reported in 1919, of extensive Basketmaker III-Pueblo I sites characterized by large groupings of contiguous storage and living rooms in association with pit-houses or "house-kivas." This, with Martin's excavations in the Ackmen-Lowry region and the Peabody Museum's work on Alkali Ridge, should put the finishing touches to the theory that "communal houses" did not appear until the beginning of Pueblo III. (2) He presents further evidence that the typical "Prudden Unit-type" small house is a Pueblo III house type.

It is through works similar to this report by Morris that come our major steps in the reconstruction of prehistory. I mean detailed accounts of *extensive excavations* in a limited area. Archaeologists recently have been in the habit of assuming that the archaeology of the San Juan is well known. Relatively, in comparison with many parts of the Southwest, this is true. Absolutely, in terms of excavated sites and detailed information, it is quite false. The La Plata report is a very welcome addition to our knowledge of the Mesa Verde region where the amount of recorded, thorough excavation is so small.

JOHN OTIS BREW
Peabody Museum
Cambridge, Massachusetts

The Ethnography of Salt in Aboriginal North America. HELEN V. HUNTER. (63 pp., Philadelphia, 1940.)

Culture Element Distributions: XV; *Salt, Dogs, Tobacco*. A. L. KROEBER. (20 pp., 11 maps $.25. Anthropological Records 6: 1, University of California Press, Berkeley and Los Angeles, 1940.)

An interesting light on two contrasting methods of anthropological research may be had from a perusal of these two papers, which were done independently and published almost simultaneously. Miss Hunter's monograph is the result of a single student's library research in secondary sources, with the results worked up as a thesis. Professor Kroeber's paper is one result of the joint efforts of a number of researchers engaged in the comprehensive ethnographic undertaking which is the University of California's Culture Element Survey West of the Rocky Mountains. A third of this paper (pages 1–6) is devoted to a consideration of salt in the area of the survey.

Miss Hunter has essayed an extensive, comparative and quasi-distributional study of the use and nonuse of salt in all aboriginal North America. Professor Kroeber offers an intensive distributional study of the same commodity in a limited area of the same continent.

Buttressed by a bibliography of works from nearly one hundred fifty authors, properly footnoted at every point, and replete with quotations beginning, "Speck said . . . , Beauchamp suggested . . . , Maire de l'Incarnation said . . . , Parker mentioned . . . , according to Lumholtz," etc. Miss Hunter's work may be typologically classified as "armchair scholasticism," such as was made famous in anthropology by Frazer, Westermark, *et al.*

Kroeber's method of presentation, on the other hand, aims at the greatest possible compression of the data. The essential facts are marshaled in four distribution maps (the cartographic symbolism of which could be much improved), and the essential textual material for elaboration, explanation and interpretation is adequately presented in no more than four pages.

Kroeber's paper is designed to serve anthropology; but Miss Hunter, alas, while striving to serve anthropology was also writing with a thesis committee in mind. For publication purposes, however, her paper would be much more effective if merely tran-

scribed to distribution maps, plus whatever explanation is necessary, along with such constructive interpretation as the author has to present.

As to the content of the studies: it is Miss Hunter's thesis that the hunting peoples, who obtain sufficient salt in the meat they eat, do not (with few exceptions) use salt as such. On the other hand, the agricultural peoples, who do not get sufficient salt in the food they eat, do use salt, and in the Southwest and Mexico work salt into a number of ritual contexts. The use and nonuse of salt, she concludes, is a function of diet. (This conclusion was also arrived at a decade ago by M. O. de Mendizabal, *Influencia de la sal en la distribucion geográphica de los grupos de Mexico*, [ICA 1928, New York], 93–100. Though de Mendizabal is cited by Miss Hunter on minor points, no reference occurs in her paper to de Mendizabal's similar conclusion for Mexico.)

In spite of the concurrence of de Mendizabal and Hunter, Professor Kroeber shows decisively that the dietary explanation of the use and nonuse of salt is not satisfactory. In the area lying between the Rockies and the Pacific an irregular line drawn from east to west, and running roughly along the northern borders of California, Nevada and Utah, separates the salt-using from the non-salt-using tribes. Specifically, " . . . there were virtually no exceptions to the rule that salt was eaten everywhere to the south and not eaten everywhere to the north of this line" (p. 1). And then, "As to animal against plant food, there is no very clear preponderance of either in either part of the region considered" (p. 2).

Professor Kroeber also explored temperature as a more likely factor, but had to reject this as a causation because of definite negative factors. His ultimate conclusion therefore is, "that whatever underlying urge there may be in physiology as influenced by diet and climate, the specific determinant of salt use or nonuse in most instances is social custom, in other words culture" (p. 2).

E. Adamson Hoebel
New York University

SOCIETY FOR AMERICAN ARCHAEOLOGY
ANNUAL MEETING—1941

The sixth annual meeting of the Society for American Archaeology was held on May 9 and 10, 1941 in Minneapolis, Minnesota, in conjunction with the twentieth annual meeting of the Central States Branch of the American Anthropological Association. The Center for Continuation Study of the University of Minnesota was headquarters for the meeting. The business meeting of the Society was called to order by Mr. Douglas S. Byers, Editor, about 5 p.m. on May 9. The meeting was temporarily adjourned at 6:30 p.m, and continued the next day after 12 noon. Approximately 25 members were present at each session.

The minutes of the fifth annual meeting were approved as printed in AMERICAN ANTIQUITY. The reports of the Secretary-Treasurer and Editor, which are appended hereto were read and accepted. The editor of the NOTEBOOK, Mr. Frederick Johnson, reported on the condition and prospects of the NOTEBOOK. His report was unanimously accepted. Mr. Martin as chairman of the nominating committee presented the report of that body in the form of the following slate:

President: Glenn Black
Vice-President: Emil Haury
Council: James B. Griffin, M. R. Harrington, James Ford
Fellows:

Jesse D. Jennings
John Reed Swanton
Clark Wissler
John Eric Sidney Thompson
Frank Cummings Hibben
Georg Neumann
Eli Lilly
Isabel Truesdell Kelly
A. T. Jackson
Edward T. Hall, Jr.
Edward H. Spicer
George F. Will
Charles Clark Willoughby
Irvin Rouse
Frederick Johnson
Philip Ainsworth Means
George I. Quimby, Jr.
Gordon Randolph Willey
Vladimir J. Fewkes
Matthew William Stirling

Nominations from the floor were called for. There being none, it was moved, seconded and passed that the nominations be closed and the Secretary be instructed to cast a single ballot in the name of the Society for the slate as read. Mr. Byers thereupon declared the new officers and Fellows to be elected.

An additional list of Affiliates who had been proposed for Fellows of the Society was submitted by the Secretary. After some discussion as to their qualifications, it was moved by Doctor Fay-Cooper Cole that the question of this group of nominations be referred to the newly constituted Council and that they be empowered to appoint as fellows any members so nominated who had the qualifications required by the Constitution and By-laws of the Society. This motion was properly seconded and passed unanimously.

Mr. Richard Morgan, member of the committee on terminology, reported for that body. The report was accepted.

Mr. James B. Griffin, Chairman of the committee on resolutions, proposed the following resolutions: Resolved that:

The Society for American Archaeology wishes to express its appreciation to Professor W. D. Wallis and members of the local group for the hospitality which has been extended to the Society.

The Society wishes to express its sense of deep loss in the death of Charles A. Amsden, W. J.Wintemberg, John E. Fast, J. B. Lillard, J. M. Mallory.

The Secretary was instructed to send copies of the resolutions to those concerned and to members of the bereaved families. The motion to accept these proposals was made, seconded and passed unanimously.

The place of the 1942 meeting was discussed and because it was felt that the Society should meet farther to the east and south, the name of Cincinnati was suggested in order that more members from the south and east might be induced to come. The council were empowered by the membership to make a choice of meeting place.

The combined meetings of the two organizations occupied the two days of Friday and Saturday May 9 and 10. Friday morning was devoted entirely to papers of the Society for American Archaeology and Saturday morning to those of the Central States Branch of the American Anthropological Association. The meetings on Friday afternoon were held jointly.

At the Friday morning session, presided over by Mr. J. H. Bailey as Chairman, the following papers were presented:—

The Boylston Street Fishweir. Frederick Johnson.
Mastodon Bones from Middle Mississippi Refuse Pits. Robert McCormick Adams.
Sites on Abandoned Beaches of Lake Huron, Ontario. Emerson F. Greenman.

The Baumer Focus. Roger W. Willis.
A Hopewell Sculptured Head. Richard G. Morgan.
Three Woodland Aspects of Northern Minnesota. Lloyd A. Wilford.
Notes on Chronology in Southern Illinois. John Bennett.
The Broken Kettle and Kimball Village Sites. Charles R. Keyes (by title only).
A Preliminary Synthesis of Eastern United States Archaeology. James B. Griffin.
The Relationship between Archaeological Cultures and Physical Types in the Eastern United States. Georg Neumann.

On Friday afternoon a symposium on the Chippewa Tribe was held and presided over by Doctor David G. Mandelbaum. The papers submitted at this meeting were as follows:

Chippewa History. Lloyd A. Wilford.
Notes on Ojibway Archaeology. Emerson F. Greenman.
Native Art of the Chippewa. Frances Densmore.
Materia Medica of the Chippewa. Gretchen Beardsley.
Chippewa Child Life. Sister M. Inez Hilger.

Doctor Mandelbaum closed the symposium with a summary and conclusions.

On Friday evening there was an informal meeting, attended by about 25 archaeologists during which Mr. Holmes Ellis led a discussion of the work accomplished by the committee on terminology. Some details of the method of selecting terms, and suggestions on keeping the number of terms as small as possible were advanced. The general consensus of opinion seemed to be that the committee had made considerable progress and that a very useful set of terms and definitions would result from its work. It was also proposed that when these were complete that they would be published in the NOTEBOOK for further criticism and suggestions.

The combined annual dinner of the Society and the Central States Branch was held Friday evening. Following the dinner a discussion of the Negro in Africa in the Present World Situation was carried on by Melville J. Herskovits of Northwestern University and David G. Mandelbaum of the University of Minnesota. Following this Professor E. W. Davis, President of the Campus Club and Director of the School of Experimental Mines, and Wilson D. Wallis ably burlesqued an amusing Socratic dialogue concerning the study of man between a layman and an anthropologist.

At 12:30 p.m. on May 10th the meeting adjourned.

THORNE DEUEL, *Secretary*

REPORT OF THE SECRETARY

The fifth annual meeting of the Society for American Archaeology was held on April 25 and 26, 1940, in Indianapolis, Indiana, in conjunction with the nineteenth annual meeting of the Central States Branch of the American Anthropological Association. The minutes of this meeting were printed in AMERICAN ANTIQUITY, Volume VI, No. 1 (July, 1940), pages 97 and 98.

An effort has been made to increase the institutional membership in the Society. 515 letters were sent to libraries throughout the United States; of these 24 memberships were received. Although 24 institutional members and 97 affiliates were added to the Society this year, 121 affiliates and 8 institutional members were dropped from the rolls of the Society at the beginning of this fiscal year, which makes a total enrollment of 866. In order to attain an increase in the number of affiliates, the Secretary requests that the Fellows and Affiliates continue to render the asistance they have in the past in obtaining members. The Society lost by death last year, three Affiliates: John E. Fast, Nogales, Arizona; J. B. Lillard, Sacramento, California; and J. M. Mallory, Macon, Georgia; two Fellows, Charles Amsden, Los Angeles, California, Vice-President of the Society, and W. J. Wintemberg, Ontario, Canada. One life member was added.

	July 1, 1940	Withdrawn	Transferred	Added	May 9, 1941
Life Fellows and Affiliates	10			1	11
Fellows	70	−2	2		70
Affiliates	716	−121	−2	97	690
Institutional Members	79	−8		24	95
Totals	875	−131	0	122	866

Several actions have been taken by the Council of the Society since the last annual meeting. Late in September 1940 it authorized the holding of a regional meeting of the Society in Philadelphia December 27–30, 1940. In January the members of the Council set the date for the present annual meeting here in Minneapolis. The Council approved the suggestion that a regional meeting be held in connection with the annual meeting of the Southwestern Division of the American Association for the Advancement of Science which met on April 28–May 1 in Lubbock. T. M. Campbell was appointed chairman for the Society.

In closing, I should like to say that the Society now stands in need of someone who can devote considerable time and effort to putting its resources on a sounder basis. Expenses this year have increased, in editorial and clerical assistance, and in printing and paper costs. The outlook for next year seems to indicate that costs will continue to rise. It will probably be necessary to find additional funds or possibly to cut certain of the services now rendered or both if the Society is to rest on a reasonably secure financial basis.

It might be desirable to consider the possibility of increasing the dues of members, or at least of the Fellows. On account of the considerable and rapidly increasing amount of correspondence and other business now falling to the Secretary-Treasurer it might also be in order to split the office and responsibilities in two. This would permit both to do more than is possible by any single officer.

Respectfully submitted,
THORNE DEUEL, *Secretary*

REPORT OF THE TREASURER

The present balance (May 1, 1941) of the Society stands as follows:

Regular Fund	$ 67.41	
Life Membership Fund	580.52	$ 647.93

Gross Receipts

Balance on Hand, July 1, 1940		$ 312.88
One Life Membership	$ 50.00	
Dues:		
1937–38	3.00	
1938–39	12.00	
1939–40	153.00	
1940–41	1764.00	
1941–42	72.00	2054.00
Sales of back volumes of AMERICAN ANTIQUITY	288.00	
Sale of single copies, AMERICAN ANTIQUITY	7.00	295.00
Sale of NOTEBOOK		1.75
Reimbursements (Reprints and illustrations)		693.63
Received for Bank Charges		5.28
		$3362.54

Gross Disbursements

AMERICAN ANTIQUITY		
Printing, illustrating, distribution	$1919.56	
Reprints	155.48	2075.15
THE NOTEBOOK		
Supplies (January and April issues)	65.00	
Postage	53.23	
Extra office help	19.20	137.43
Secretarial Assistance and clerical help		
Office of the Secretary-Treasurer	$35.00	
Office of the Editor	80.00	
Editors Assistant	100.00	$ 215.00
Stationery and Printing		95.85
Postage, telegrams, express, etc.		168.75
Bank service and exchange charges		3.68
Discounts to subscription agencies		15.75
Refunds on over-payment of dues		3.00
Cash on hand, May 1, 1941		647.93
		$3362.54

Resources

Cash on hand, May 1, 1941	$ 647.93
Due from 1939–40 dues	174.00
Due from 1940–41 dues	645.00

Due from reimbursements	34.74
	$1501.67

Liabilities

Dues for 1941–42 already paid	72.00
Amount due for printing April 1941, AMERICAN ANTIQUITY	517.04
Office help for April issue, Notebook	15.88
Postage for April issue, Notebook	1.38
Mimeographing cards for announcing meeting	2.75
Refund to Wm. S. Fulton, Life Member, Pd. three years dues through error	9.00
	618.05

Respectfully submitted,
THORNE DEUEL, *Treasurer*

REPORT OF THE EDITOR

During the past year Volume 6 of AMERICAN ANTIQUITY totalling 400 pages was published. Little need be said about the volume save that we were fortunate in that many illustrations were subsidized by authors and some of the longer articles were in part subsidized.

During the year the Council gave its assent to the appointment of Dr. George C. Vaillant to the position of Associate Editor in which he will share with the Editor the responsibility for bringing out the journal. The Council also gave its approval to the appointment of Miss Marian W. Smith as editorial assistant and to the payment to her of a modest salary. This had taken much of the heaviest load from the shoulders of the Editor and left him free to carry on correspondence which has resulted in the securing of papers from persons now carrying on research in various parts of the country. The results of this change will be seen in Volume 7 of which the first number will appear in July. The volume is being assembled in part on the basis of numbers confined to geographical areas with successive issues containing papers which will supplement each other to a certain extent.

A degree of apathy toward the journal has been apparent among our colleagues, more marked in certain sections of the country than in others. It is hoped that this slight change in editorial policy may help to break this down and to bring more general interest. The state of semi-starvation which faced the journal had been definitely relieved.

Only two papers have been received from amateurs, many of whom complain of the over technical language used by some authors. It seems that this point might well be considered if the journal is to receive the continued support of the larger part of our members.

Minor changes have been made in format in order to permit the inclusion of more material in each issue. To this end the Correspondence division has been consolidated with Facts and Comments in order to prevent the wasting of space between sections.

Some comment should be made concerning the NOTEBOOK; this I leave to Mr. Frederick Johnson who has expended much time and thought on the release.

Respectfully submitted,
DOUGLAS S. BYERS, *Editor*

REPORT OF THE EDITOR OF THE NOTEBOOK

During the fiscal year of 1940–1941 but two numbers of the NOTEBOOK were issued, although in previous years it has been the custom to distribute six numbers. This falling off is decidedly ominous and unless more manuscript material is submitted, publication will have to be suspended regardless of the wishes of the Society. The April number just issued is the first number of Volume 2.

The lack of material for publication in the NOTEBOOK, a problem that has been the cause of some concern, was finally brought to the attention of the membership with an open letter by Dr. Carl E. Guthe. The response to this letter was gratifying from the point of view of past experience. However, in relation to the total membership, the sixteen responses and half a dozen or so verbal comments were indeed scanty recognition. These letters urged, in various ways, that the NOTEBOOK be continued, and requested, in addition, that the present editorial policies be continued, and that the NOTEBOOK should continue in its informal and unauthoritative way, to publish notes and queries concerning all aspects of archaeology.

Such a situation presents something of a dilemma. A portion of the membership calls for the continuation of the NOTEBOOK, but very little has been submitted for publication. It is now the policy to issue the NOTEBOOK irregularly as the quantity of material warrants. At present the editor has nothing in his files for the next issue, formerly scheduled to appear in May, but it is possible that briefs of the papers read at this meeting will supply sufficient copy. Even if it were practical, it is inadvisable for the editor to write the text of the NOTEBOOK himself. Such would result in a one-sided publication having to do with a single archaeological area.

Provided the membership sees fit to produce material for publication, there are one or two additional sources of information which may be tapped. Perhaps the most important of these are the local or state archaeological societies, particularly those which have no outlet for the writings of their members. In order to get at this source the members must cooperate with the editor and send him at least the names and addresses of the secretaries or other officers of the respective societies. Another type of information which may be included in the NOTEBOOK is the announcement and program for the Annual Meeting, which might be distributed in the NOTEBOOK about April 15th. I suggest that at this meeting a schedule be developed so that the various committees may be able to put in the hands of the editor a suitable announcement. This to be done by March 1st at the latest. Such a procedure is not new to societies of this kind and the time and dates involved are similar to those which characterize the activities of similar organizations. As a matter of fact some of the larger societies, particularly in the engineering fields, require that briefs of papers to be read be published a month or more before the meeting is held.

The editor also suggests that briefs of papers to be read at the meetings be published in the number which is normally issued in June. If this is acceptable, it means that the Program Committee should be instructed to secure briefs of papers read at the meetings. Because of human frailties it is advisable that these briefs be submitted with the title of the manuscript. By so doing the editor of the NOTEBOOK will be able to obtain the briefs in time for publication.

Respectfully submitted,
FREDERICK JOHNSON, *Editor of the* NOTEBOOK

SOME RECENT PUBLICATIONS

UPPER NORTH AMERICA

Adams, Robert McCormick, *Archaeological Investigations in Jefferson County, Missouri, 1939–40* (Transactions of the Academy of Science of St. Louis 30, No. 5. 221 pp., 13 plates. 1941).

Ball, Sydney H., "The Mining of Gems and Ornamental Stones by American Indians" (*U. S. Bureau of American Ethnology Bulletin* 128, *Anthropological Papers* 13. 78 pp., 33 plates, 1 map. Washington, 1941).

Batchelor, C. S. and R. Edward Steck, "Indian Archeology in and Around Bridgeport, Connecticut" (*Bulletin of the Archaeological Society of Connecticut* 12. pp. 19–27. New Heaven: Peabody Museum, 1941).

Coffin, C. C., "Red Paint Graves" (*Bulletin of the Archaeological Society of Connecticut* 12. pp. 3–11, 2 plates. New Haven: Peabody Museum, 1941).

Douglass, A. E., "Notes on the Technique of Tree-Ring Analysis, II" (*Tree-Ring Bulletin* 7, No. 4. pp. 28–34, illus. Tucson: Tree-Ring Society, 1941).

Driver, Harold E., *Girls' Puberty Rites in Western North America* (Anthropological Records 6, No. 2. pp. 21–90, tables. Berkeley: University of California Press, 1941).

Einarsson, Stefan, "Westward from Vinland: A Review" (*Geographical Review* 31, No. 2. pp. 312–314. New York: American Geographical Society of New York, 1941).

Farmer, Malcolm F., "The Growth of Navaho Culture" (*San Diego Museum Bulletin* 6, No. 1. pp. 8–16. San Diego: The Museum, 1941).

Fenton, William N., "Iroquois Suicide: A Study in the Stability of a Culture Pattern" (*U. S. Bureau of American Ethnology Bulletin* 128, *Anthropological Papers* 14. pp. 79–138, 3 plates. Washington, 1941).

Fenton, William N., "Tonawanda Longhouse Ceremonies: Ninety Years after Lewis Henry Morgan" (*U. S. Bureau of American Ethnology Bulletin* 128, *Anthropological Papers* 15. pp. 139–165, 9 plates. Washington, 1941).

Ford, J. A. and Gordon R. Willey, "An Interpretation of the Prehistory of the Eastern United States" (*American Anthropologist* N.S. 43, No. 3, Pt. 1. pp. 325–363, tables. Menasha, 1941).

Gahan, Laurence K., "The Nipmucks and Their Territory" (*Massachusetts Archaeological Bulletin* 2, No. 4. pp. 2–6. Cambridge: The Society, 1941).

Gillin, John, "Chatto's Measurements; A Footnote to Western History" (*New Mexico Anthropologist* 5, No. 1. pp. 3–6. Albuquerque: University of New Mexico, 1941).

Harrington, M. R., "Indian Tribes of the Plains" (*Masterkey* 15, No. 4. pp. 116–128, illus. Los Angeles: Southwest Museum, 1941).

Hobbs, Hulda R., "Two Texas Panhandle Ruins" (*El Palacio* 48, No. 6. pp. 121–129, illus. Santa Fe, 1941).

Hurst, C. T., "The Second Season in Tabeguache Cave" (*Southwestern Lore* 7, No. 1. pp. 4–19. Gunnison: Colorado Archaeological Society, 1941).

Hurt, Wesley R., Jr., "Notes on the Santa Ana Indians" (*El Palacio* 48, No. 6. pp. 131–143, illus. Santa Fe, 1941).

Kelley, J. Charles, T. N. Campbell and Donald J. Lehmer, *The Association of Archaeological Materials with Geological Deposits in the Big Bend Region of Texas* (Sul Ross State Teachers College Bulletin 21, No. 3. pp. 9–175, illus. Alpine, Texas: The College, 1940).

Kent, Kate Peck, "Notes on the Weaving of Prehistoric Pueblo Textiles" (*Plateau* 14, No. 1. pp. 1–11, illus. Flagstaff, Arizona: Museum of Northern Arizona, 1941).

Kluckhohn, Clyde, "Notes on Navajo Eagle Way" (*New Mexico Anthropologist* 5, No. 1. pp. 6–14, illus. Albuquerque: University of New Mexico, 1941).

McClintock, Walter, "The Thunderbird Motive in Blackfoot Art" (*Masterkey* 15, No. 4. pp. 129–134, illus. Los Angeles: Southwest Museum, 1941).

Malouf, Carling, "Notes on the Archeology of the Barrier Cañon Region, Utah" (*Masterkey* 15, No. 4. pp. 150–153, illus. Los Angeles: Southwest Museum, 1941).

Parsons, Elsie Clews, *Notes on the Caddo* (American Anthropological Association Memoir 57. 76 pp., illus. Menasha, 1941).

Rainey, Froelich, "The Ipiutak Culture at Point Hope, Alaska" (*American Anthropologist* N.S. 43, No. 3, Pt. 1. pp. 364–375, 7 plates. Menasha, 1941).

Reed, Erik K., "Information on the Navaho in 1706" (*American Anthropologist* N.S. 43, No. 3, Pt. 1. pp 485–487. Menasha, 1941).

Renaud, E. B., *Western and Southwestern Indian Skulls* (Anthropological series 1st paper. 94 pp., illus. Denver: University of Denver, 1941).

Rowe, John Howland, "Archaeology and History in Eastern Maine" (*Masschusetts Archaeological Society Bulletin* 2, No. 4. pp. 7–13. Cambridge: The Society, 1941).

Russell, Lyent W., "A Red Paint Grave in Guilford" (*Bulletin of the Archaeological Society of Connecticut* 12. pp. 11–19, 3 plates. New Haven: Peabody Museum, 1941).

Sayles, E. B. and Ernst Antevs, *The Cochise Culture* (Medallion Papers 29. 81 pp., 17 plates. Globe, Arizona: Gila Pueblo, 1941).

Smith, Gerald A., "Acorn Mush" (*Masterkey* 15, No. 4. pp. 134–136. (Los Angeles: Southwest Museum, 1941).

Sowers, Ted C., *The Wyoming Archaeological Survey* (31 pp., 21 plates. Laramie, Wyoming: University of Wyoming and WPA State of Wyoming, 1941).

Speck, Frank G., "Art Processes in Birchbark of the River Desert Algonquin, A Circumboreal Trait" (*U. S. Bureau of American Ethnology Bulletin* 128, *Anthropological Papers* 17. pp. 229–274, 11 plates. Washington, 1941).

Spoehr, Alexander, *Camp, Clan, and Kin among the Cow Creek Seminole of Florida* (Field Museum of Natural History Anthropological series 33, No. 1. 27 pp. Chicago: Field Museum, 1941).

Steward, Julian H., "Archeological Reconnaissance of Southern Utah" (*U.S. Bureau of American Ethnology Bulletin* 128, *Anthropological Papers* 18. pp. 275–356, 10 plates. Washington, 1941).

Steward, Julian H., *Culture Element Distributions: XIII, Nevada Shoshone* (Anthropological Records 4, No. 2. pp. 209–359, tables. Berkeley: University of California Press, 1941).

Stewart, Omer C., *Culture Element Distributions: XIV, Northern Paiute* (Anthropological Records 4, No. 3. pp. 361–446, tables, maps. Berkeley: University of California Press, 1941).

Tichy, Marjorie Ferguson, "An Unusual Specimen from Paa-ko" (*El Palacio* 48, No. 7. pp. 155–157. Santa Fe, 1941).

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